

# Coa|Age

JULY, 1942



**"UNITED WE STAND"**



WAR BONDS  
STAMPS  
VICTORY

# now..They Keep 'em Loading



## SUN MINE LUBRICANTS

**Eliminated 96% of "Time Out" for Clutch Cleaning**

"Clutch trouble, due to faulty lubricants, caused shutdowns of mining machines every two weeks for cleanouts. Careful study of operating conditions and a switch to Sun Mine Lubricants resulted in elimination of trouble, clutches requiring cleaning only once a year and cost of lubrication cut 25%."

That's a typical report of a Sun Oil Engineer—one of those Doctors of Industry who are constantly working shoulder to shoulder with mine superintendents to help boost production from seam to chute. Day in . . . day out, Sun Engineering service and Sun

Mine Lubricants are working as a team to reduce power drag . . . step up efficiency . . . and increase production to provide fuel for America's greatest production job.

Sun's Doctors of Industry always stand ready, willing, and able to help you. For helpful case histories of how they have aided others, write for your free copy of "Helping Industry Help America."



**SUN OIL COMPANY • Philadelphia**

**SUNOCO**

## SUN PETROLEUM PRODUCTS

**HELPING INDUSTRY HELP AMERICA**



**SUN MINE  
LUBRICANTS**

include:

SUN Pressure Grease  
SUN Compressor Oils  
SUN Journal Oils  
SUN Mine Car Lubricants  
SUN Ball & Roller  
Bearing Greases



## Rubber soaks up the smack of a 2-mile fall

*A typical example of B. F. Goodrich development in rubber*

UNLIKE cats, parachutists can't always land on their feet. And when they don't, hips and backs can be broken.

An army engineer had an idea for sponge or foam rubber back and seat cushions that would absorb the shock of such landings and serve as seats while the flyer was in the plane. The air in the foam should be trapped for maximum cushioning, but the coverings leaked. Trouble was that when you wrap something soft like foam rubber, you can't put enough pressure on the wrapping to make a tight seam.

• The engineer and the company he

had employed were stopped. They would either have to go to very thick, bulky foam rubber (impossible because it would be awkward) or abandon the whole safety idea.

Then the army officer talked to B. F. Goodrich engineers. They had developed, years ago for industrial products, the Anode system of covering foam rubber (or anything) with a seamless coating of soft rubber to any needed thickness by a single dip in a latex bath. This rubber coating trapped the air in the soft foam perfectly, and there is no fear of leakage, because the Anode covering is uniform, tough

and strong. It's sealed on by dipping — no pressure needed.

This B. F. Goodrich Anode system of depositing rubber is used for many things. It makes greater precision possible in surgeon's gloves, rubber tubing, diaphragms. It's "in the Army now," used on crash pads in tanks and many other war products. It will help improve many other products or processes, too, when peace comes and it is available again. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

### B. F. Goodrich

FIRST IN RUBBER

# FREEDOM *and* FRICITION

There are in the world today a vast number of "friction devils" intent upon the deterioration and ultimate destruction of American freedom and liberty! Some of these devils are abstract and some are very real. There are lesser cousins of these enemies of American freedom that lurk in coal mine equipment. Hulburt Lubrication Engineers specialize in their removal. Write for your down-in-the-mine survey today. Freedom and Friction don't mix.

**HULBURT OIL & GREASE COMPANY**

*Specialists in Coal Mine Lubrication*

PHILADELPHIA . . . PENNSYLVANIA



# HULBURT

# DON'T MIX!



# QUALITY GREASE

# NO EXPENSIVE TOW-IN'S!



## PHILCO XL BATTERIES

*with 10% Greater Capacity*

give you vital Reserve Power for Emergencies!

Joy Shuttle Cars or mine locomotives, powered with Philco XL Storage Batteries, have a 10% *reserve* of power—a reserve that brings the car in safely when an ordinary battery would leave it stranded. Plate for plate, these husky Philco Batteries give you 10% greater capacity!

Philco's extra capacity...sustained high voltage...long productive life is the result



of 50 years of practical battery experience and development work out of which has come such advances as Philco "K" Process plates...Philco Triple Insulation...Philco Construction.

And now, with production facilities *tripled* in our new Trenton plant, you can get Philco Batteries for Joy Shuttle Cars in 7 days after receipt of order! Specify Philco!



PHILCO STORAGE BATTERIES...DEPENDABLE MOTIVE POWER  
FOR YOUR JOY SHUTTLE CARS AND MINE LOCOMOTIVES

### NEW CATALOG

Write today for the new Philco Mine Locomotive and Shuttle Car Battery catalog. Philco Storage Battery Division, 481 Calhoun Street, Trenton, N. J.

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year \$4  
Britain a  
year 60  
tries \$5  
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JULY 1942

Thirty-Five Cents Per Copy

# Coal Age

**Old Glory** flies proudly and serenely on our front cover this month, reminding us that keeping it that way is our biggest job. Rolling out the coal is the business job of the industry. Buying war bonds and stamps is the personal job.

An early user of rubber-tired haulage was the Hart Coal Corporation, of western Kentucky, which still finds it a highly efficient cost-cutting tool. A story of Hart's new mine, incorporating many improvements gained through experience, therefore leads off the July feature section (p. 45).

**Mechanical - mining** articles scheduled for coming issues include a dissertation on tandem scrapers for higher efficiency in this time of work, descriptions of shuttle-car operation in both regular work and recovery of old pillars, and an account of highly successful pillar recovery with both mobile loaders and shaker

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Volume 47

No. 7

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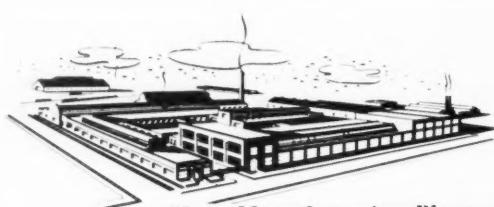
# WOOD

## A GOOD NAME TO REMEMBER ALWAYS

• The name WOOD stands for SPECIALIZATION . . . a large modern plant and national organization devoted to the one aim of making the finest Shovels, Spades and Scoops that can be made.

Each and every tool bearing a name of our brands is built to "take it." Blades are of special steels . . . precision tempered to super toughness. Handles are of specially selected, well-seasoned northern white ash . . . strong, resilient, long-lasting.

Wood standards of manufacture are unvarying . . . Wood products have won an international reputation for uniform and unqualified excellence. "If it's made by WOOD — it must be good."



Main Manufacturing Plant of  
The Wood Shovel and Tool Co.



The WOOD "BIG  
FIST" BRAND  
the leading coal shovel  
in the mines of  
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WOOD

is cooperating in  
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in Shovels, Spades  
and Scoops.

•THE• **WOOD SHOVEL** •AND• **TOOL** •CO.•  
PIQUA, OHIO

→ (CONTINUED FROM PAGE 5)

conveyors in a thick pitching seam.

**Advanced ideas** for washing large sizes, screen and mechanical drying of the smaller grades and blending of mine-run in dumping feature the new Piney Fork plant of the Hanna Coal Co. How these problems were worked out is the theme of this month's preparation story (p. 47). Coming up is an account of changes at Weirton's Isabella plant, in Pennsylvania, for better results at lower cost.

**Maintenance and electrification**, vital in mechanical operation, are represented in this issue by a description of the new Purseglove shop (p. 54), a two-story affair with elevator, and an account of an unusual borehole suspension by Ernest P. Jaggard (p. 60).

**Electrical safety** is the theme of an article starting on p. 52, while spraying of shortwall undercuts to reduce the dust hazard, by D. H. Davis, Pittsburgh Coal Co., is abstracted on p. 58.

**Meetings** ring the bell this month also. Operation, safety and coal utilization were analyzed by the Rocky Mountain Coal Mining Institute (p. 44), Mine Inspectors' Institute of America (p. 41), Battelle Memorial Institute (p. 43) and the Illinois Mining Institute (p. 94).

**On the fire** for the future, among other timely and pertinent articles, are maintenance and shop practices at a far-western mechanical operation, an unusual fan drive, deep-well pumping economies, power generation, etc., all well worth a scanning by coal-mining men.

# HOW'S BUSINESS

## GENERAL BUSINESS CONDITIONS

Industry is feeling the effect of plant expansion for production of war commodities as well as curtailment of output of civilian products, intensified by the uneven impact of priorities starting currents that run against the general tide of production and demand, according to *Business Week*. The War Production Board's task is to fit production to the needs of military strategy. *Business Week* Index was 182.1 for the week ended June 13, as against 183.0 for the preceding week and 181.0 a month earlier.

## ELECTRIC POWER OUTPUT

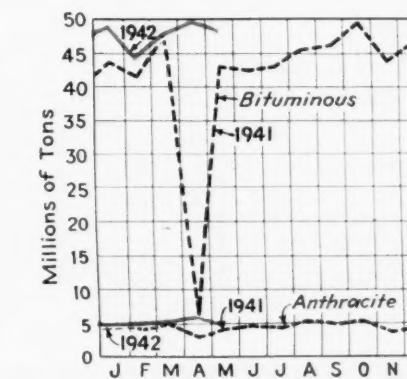
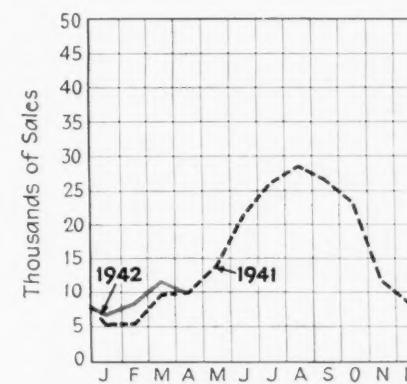
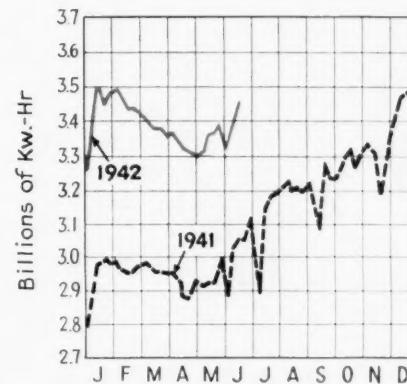
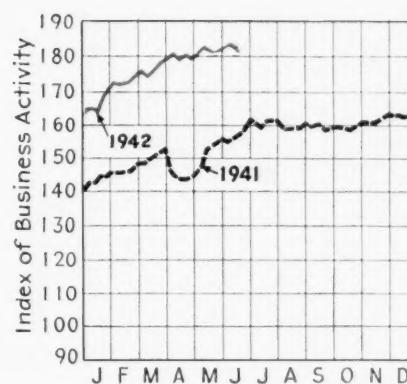
Output of electric energy by the electric light and power industry for the week ended June 13, according to the Edison Electric Institute, was 3,463,528,000 kw.-hr., an increase of 90,000,000 kw.-hr. over the preceding week and a gain of 11.7 percent over the corresponding week of last year. Production for other recent weeks was: May 23, 3,379,000,000 kw.-hr.; May 30, 3,323,000,000; June 6, 3,372,000,000 kw.-hr.

## COAL STOKER SALES

Mechanical stoker sales in the United States in April last totaled 9,989 units (U. S. Bureau of the Census from 101 manufacturers), compared with 11,268 in the preceding month and 10,146 in April, 1941. Sales of small units in April last were: Class 1 (under 61 lb. of coal per hour), 8,360 (bituminous, 7,260; anthracite, 1,100); Class 2 (61-100 lb. per hour), 566 (bituminous, 503; anthracite, 63); Class 3 (101-300 lb. per hour), 647.

## COAL PRODUCTION

Bituminous coal produced by United States mines in May last (preliminary) totaled 48,250,000 net tons, according to the Bituminous Coal Division, U. S. Department of the Interior. This compared with 49,000,000 tons in the preceding month and 42,892,000 tons in May, 1941. Anthracite tonnage in May last, according to the U. S. Bureau of Mines (preliminary), was 4,843,000, as against 5,153,000 (revised) in the preceding month and 3,858,000 tons in May, 1941.





### ANSWER:

#### *Bureau of Mines Tests PLUS Bureau-Approved Methods of Use*

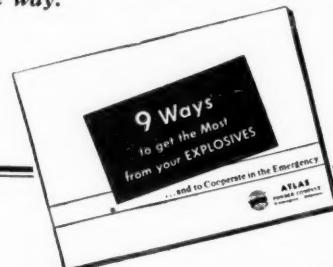
The U. S. Bureau of Mines designates as "Permissible Explosives" only those which it has approved for use in coal mines. Not only must each cartridge marked "permissible" conform to the sample tested by the Bureau, but it must be used under approved conditions.

**Bureau of Mines Tests:** Most important are those in which 1½-lb. charges of the explosive are fired ten times from a cannon into a gallery containing explosive mixtures of air and natural gas or air, natural gas and coal dust. To pass these tests, the explosives must not ignite any of the gas mixtures. Other tests determine strength and sensitivity to frictional impact, and to detonation.

**Summary of Approved Conditions of Use:** Permissible explosives must be fired by electric blasting caps.

Not more than 1½ lbs. may be used in one shot. Each shot must be confined with incombustible stemming. Shots must not be bored into the solid, or have burdens so heavy they are liable to blow out. Shots must not be fired in the presence of a dangerous percentage of firedamp.

*Safety is vital to the increased production required by the war effort. It is more important than ever to use the right "permissible" in the right way.*



Write for your copy of the booklet "9 Ways to Get the Most from Your Explosives."

ATLAS POWDER COMPANY



WILMINGTON, DELAWARE

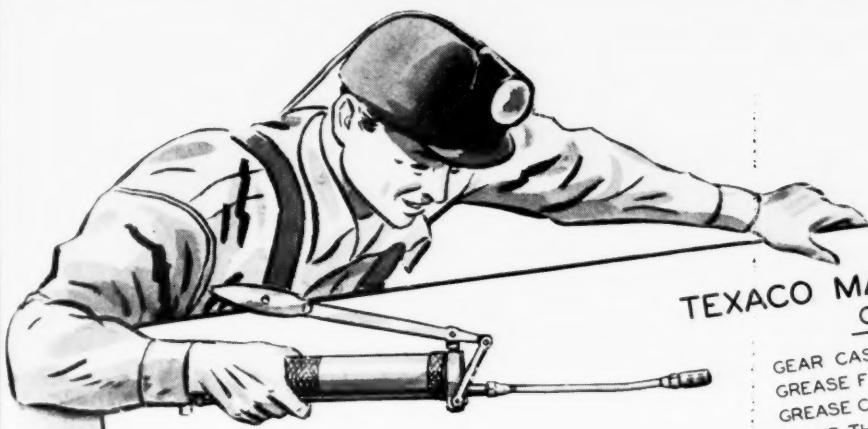
# ATLAS

EXPLOSIVES

Offices in  
Principal Cities

*"Everything  
for Blasting"*

# WAR-TIME MAINTENANCE IDEA

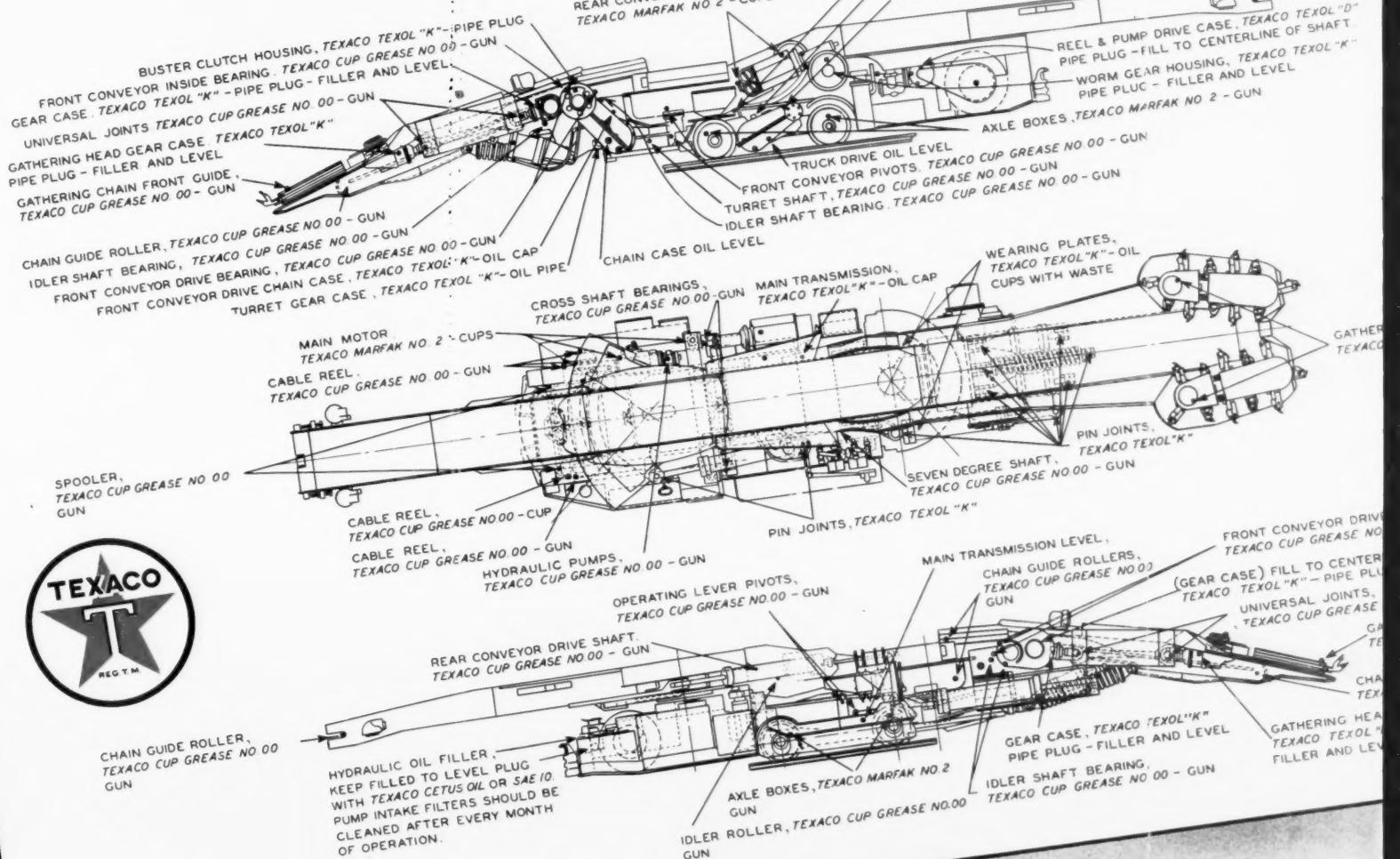


## TEXACO MAINTENANCE LUBRICATION CHART GOODMAN 460 TRACK LOADER

GEAR CASES - ADD OIL EACH SHIFT TO MAINTAIN OIL LEVEL  
GREASE FITTINGS - LUBRICATE EACH SHIFT  
GREASE CUPS - FULL TURN EACH SHIFT, EXCEPT MOTORS -  
GIVE THESE CUPS ONE TURN EACH WEEK TO AVOID OVERLUBRICATION.

TRUCK DRIVE TEXACO CUP GREASE NO 00 - GUN  
TRUCK DRIVE CHAIN CASE, TEXACO TEXOL "K" - OIL COVER  
TRUCK DRIVE BEARING, TEXACO CUP GREASE NO 00 - GUN

CHAIN GUIDE R.  
TEXACO CUP GR.

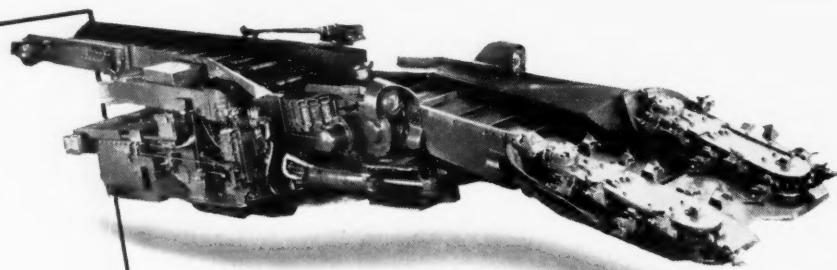


CHARTS FOR UNDERGROUND MACHINERY ARE AVAILABLE

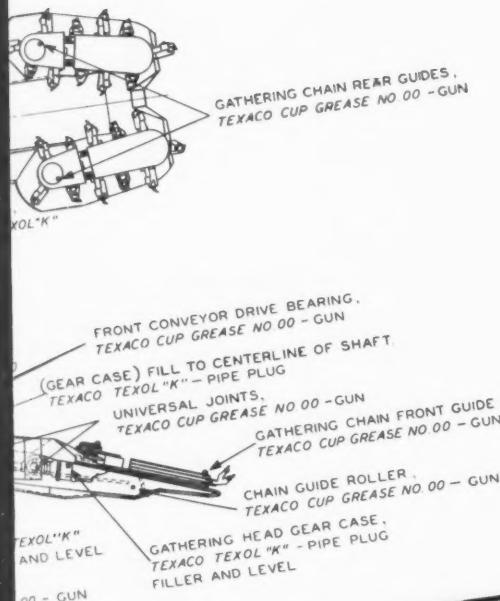
## TEXACO MAINTENANCE CHARTS

FO

# MAINTENANCE Checkdowns



- GUN  
L "K" - OIL COVER  
REASE NO 00 - GUN  
CHAIN GUIDE ROLLER.  
TEXACO CUP GREASE NO 00 - GUN  
DRIVE CASE, TEXACO TEXOL "D"  
FILL TO CENTERLINE OF SHAFT.  
AR HOUSING, TEXACO TEXOL "K"  
- FILLER AND LEVEL  
RFAK NO 2 - GUN



## TEXACO MAINTENANCE LUBRICATION CHARTS

**assure added life for  
Locomotives, Cutters, Loaders, etc.**

**WRITE FOR YOURS TODAY—NO OBLIGATION**

Designed to be tacked up on the wall at all lubrication stations, Texaco Maintenance Lubrication Charts show exactly *where, when, and with what* specific lubricant to service each lubrication point on your cutters, loaders, locomotives, etc.

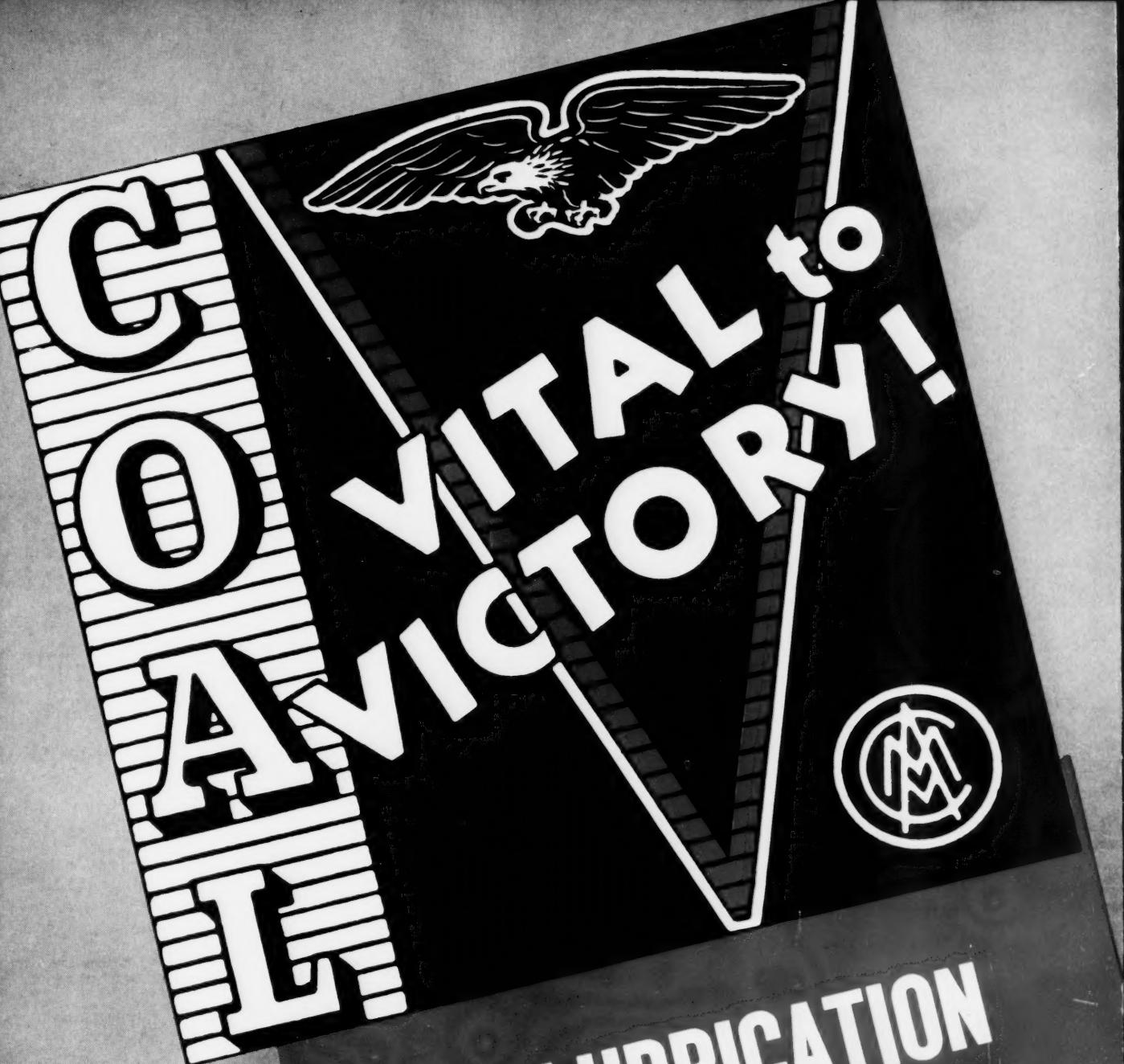
Worked out in cooperation with coal-mining machinery manufacturers, and kept up-to-date as designs changed, with products approved by the builders. Following these charts will assure more continuous operation, less time out for repair and maximum service from costly parts.

For full-size charts (18" x 12") of your equipment (please give make and model), write, wire or phone The Texas Company, National Sales Division, Dept. C, 135 East 42nd St., New York, N. Y.

# MAINTENANCE LUBRICATION FOR THE COAL MINING INDUSTRY







...and LUBRICATION  
vital to 24 hrs. a day operation

The task of producing coal at the rate of 660 million tons per year for our nation's war effort requires continuous output of cutters, loaders, locomotives and all mining machinery.

Lubrication is the primary factor in maintenance, therefore "proper" lubrication will prolong the useful life of all machinery.

On the inside of this insert is shown one of many maintenance lubrication charts that will assist coal-mining operators in keeping their machinery on the job so that production schedules can be met.

Every dot on this map indicates the location of a Texaco distribution point.

## TEXACO LUBRICATION SERVICE

is available in all coal-mining areas...

The shaded portions of this map indicate the nation's principal coal-producing areas. The dots indicate the location of Texaco distribution points. Note how completely Texaco covers the industry, for prompt delivery of lubricants specified on Texaco Maintenance Lubrication Charts.

In using Texaco Lubricants, you are following the lead of the railroads, the copper mines, the airlines, the stationary Diesel field and the U. S. Government.

THE TEXAS COMPANY



## WIRE ROPE LASTS LONGER WITH PROPER CARE

# 8 tips on lubricating WIRE ROPE

You'd have to look a long way to find a piece of equipment able to stand up under the terrific abuse which wire rope handles every day as a matter of course. Just because wire rope *can* take it, however, is no reason to subject the rope to abuses which could be avoided.

Take lubrication, for instance. You wouldn't think of running your car without plenty of oil in the crank-case. Wire rope, too, is a machine. In action, its many individual wires move relative to each other and twist around their own axes. To protect these "bearing" surfaces from rust and from wear, follow the simple rules outlined below. You'll be well repaid in longer service.

1. Clean wire rope carefully before lubricating it. Remove grit, dirt and other foreign matter with kerosene or gasoline and a stiff brush. Another method is to pull the rope through a tightly-wrapped swab.
2. If the rope has been working in a wet atmosphere, it may be coated with hydrated rust—a slimy film that cannot be removed until the rope is *thoroughly* dried out. To apply oil or grease on top of hydrated rust is simply wasted effort.
3. Choose a lubricant which is suited to the size and construction of rope, and to the working conditions. A stiff rope, with fewer, larger wires, requires a heavier lubricant, in general, than a more flexible rope with a greater number of wires.
4. When applying heavy lubricants to wire rope, thin them out by heating, so as to get the desired penetration.

Use an ordinary metal vat or box with a gas flame under it. Pull the rope slowly through the hot lubricant. A sheave, partly submerged in the vat, will hold the rope down so that the lubricant can penetrate more readily.

5. If you are not using a heated vat, or a special drip-oiling device, the lubricant may be applied with an oil can or a paint brush, dipped in the lubricant.
6. Don't just apply any-oil—that's handy to your wire rope. Some lubricants have an acid base and will actually eat into the wires, thus seriously damaging the rope. Be certain that the lubricant you apply to your rope is the correct one—that it won't "fight" with the lubricants already in the rope.
7. Ropes that operate at elevated temperatures require a lubricant that will hold its body at the working temperature. Use a fairly heavy lubricant, heat it above the working temperature of the rope, let it penetrate completely among the wires. It will cool and thicken at room temperature. But in service, the heat will thin out the lubricant to the right consistency.
8. Never let your wire rope rust or become dry of oil. Watch it carefully in service. Experience will show you how often to lubricate for best results. Every type of wire-rope job presents its own lubricating problem. If the load is heavy—if the rope works at high speed—bends frequently around sheaves—is exposed to moisture, grit or corrosive fumes—be particularly careful about lubrication. Remember, wire rope is a machine, and machines don't last long without proper lubrication.

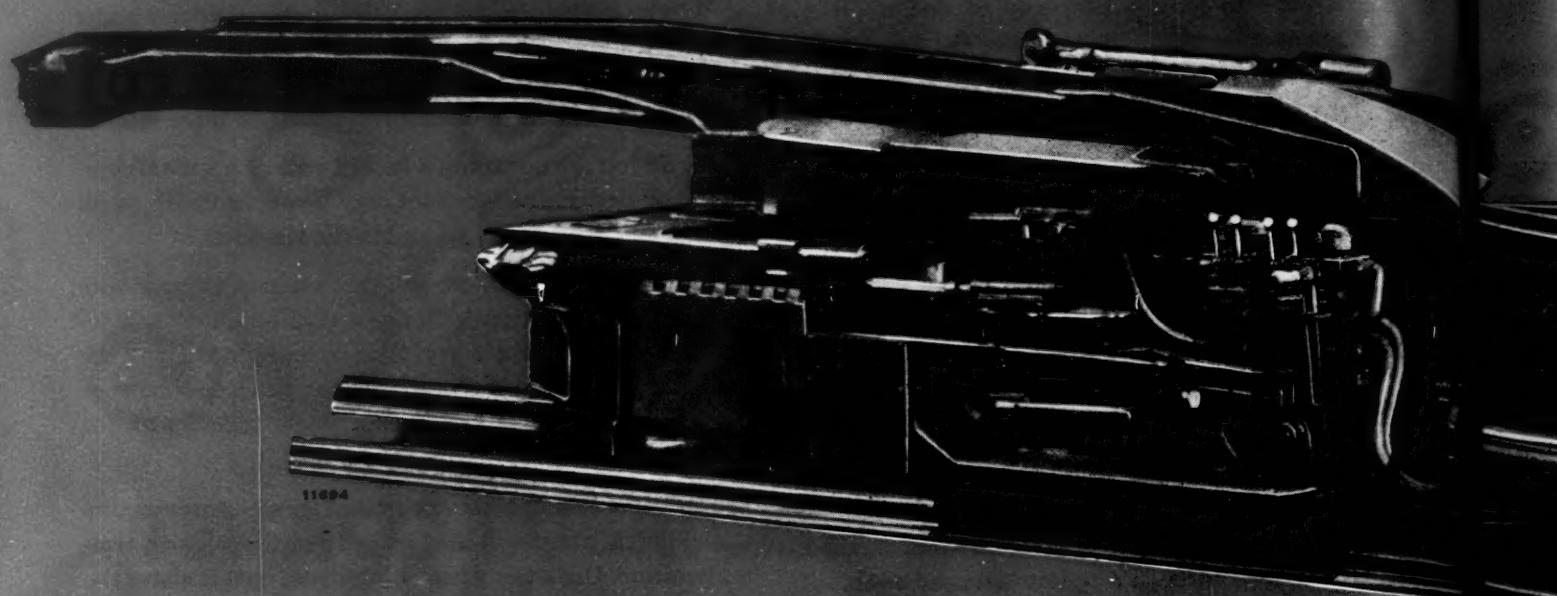
## BETHLEHEM STEEL COMPANY



*Operating Continuity..* 1

WITH THE GOODMAN

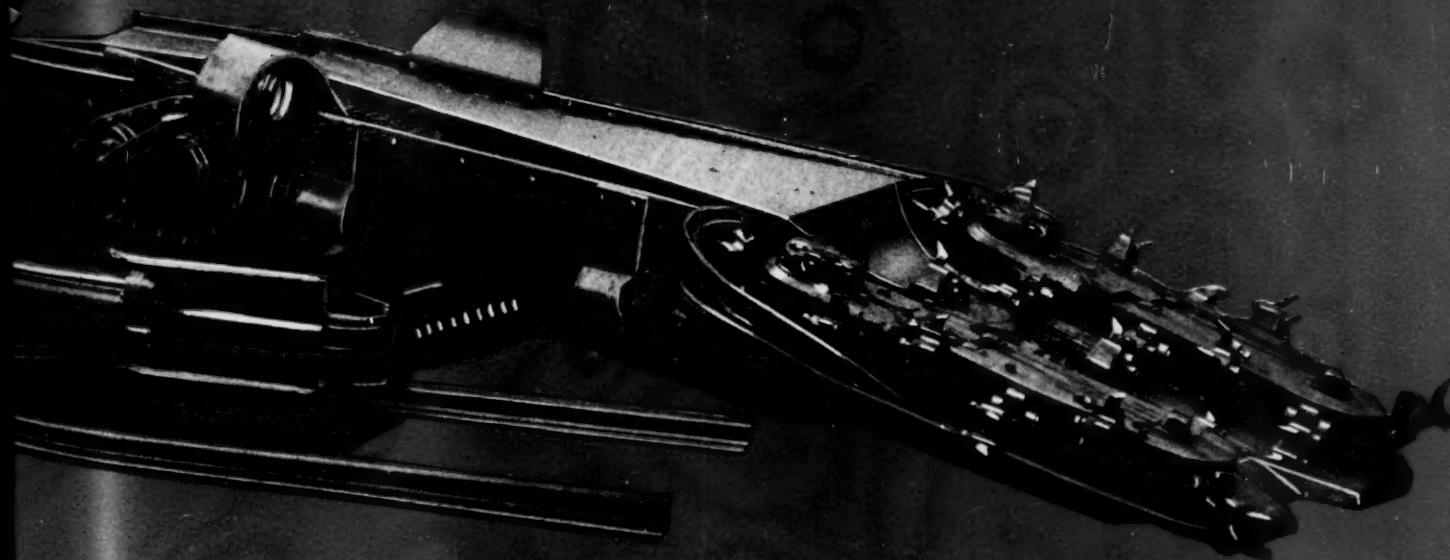
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GOODMAN MANUFACTURING COMPANY

*Low Maintenance Cost*

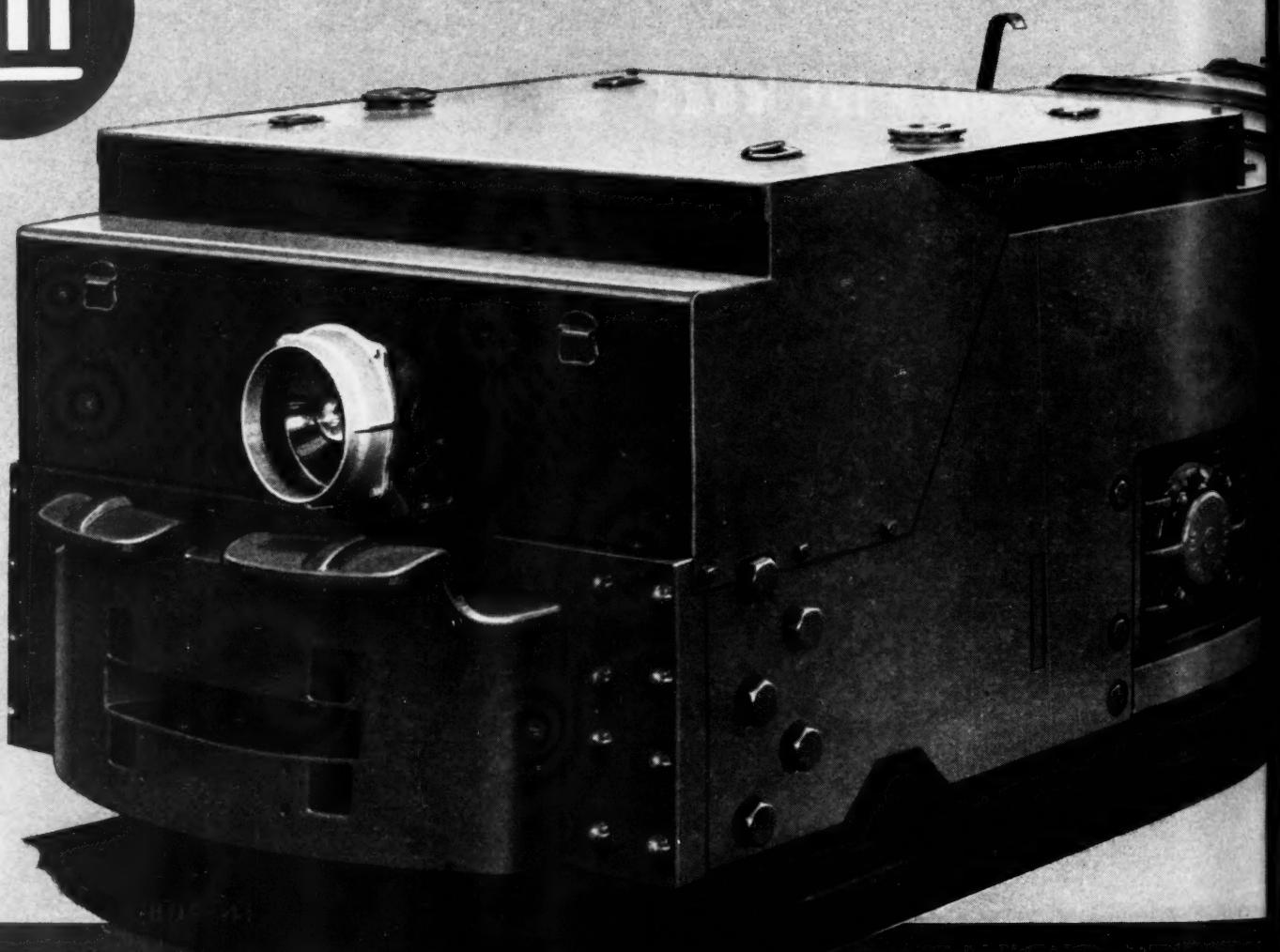
**460 LOADER**



The Goodwin 460 is designed to conform to mechanization's ultimate objective—move coal quickly and economically.

**HALSTED STREET AT 48TH • CHICAGO, ILLINOIS**

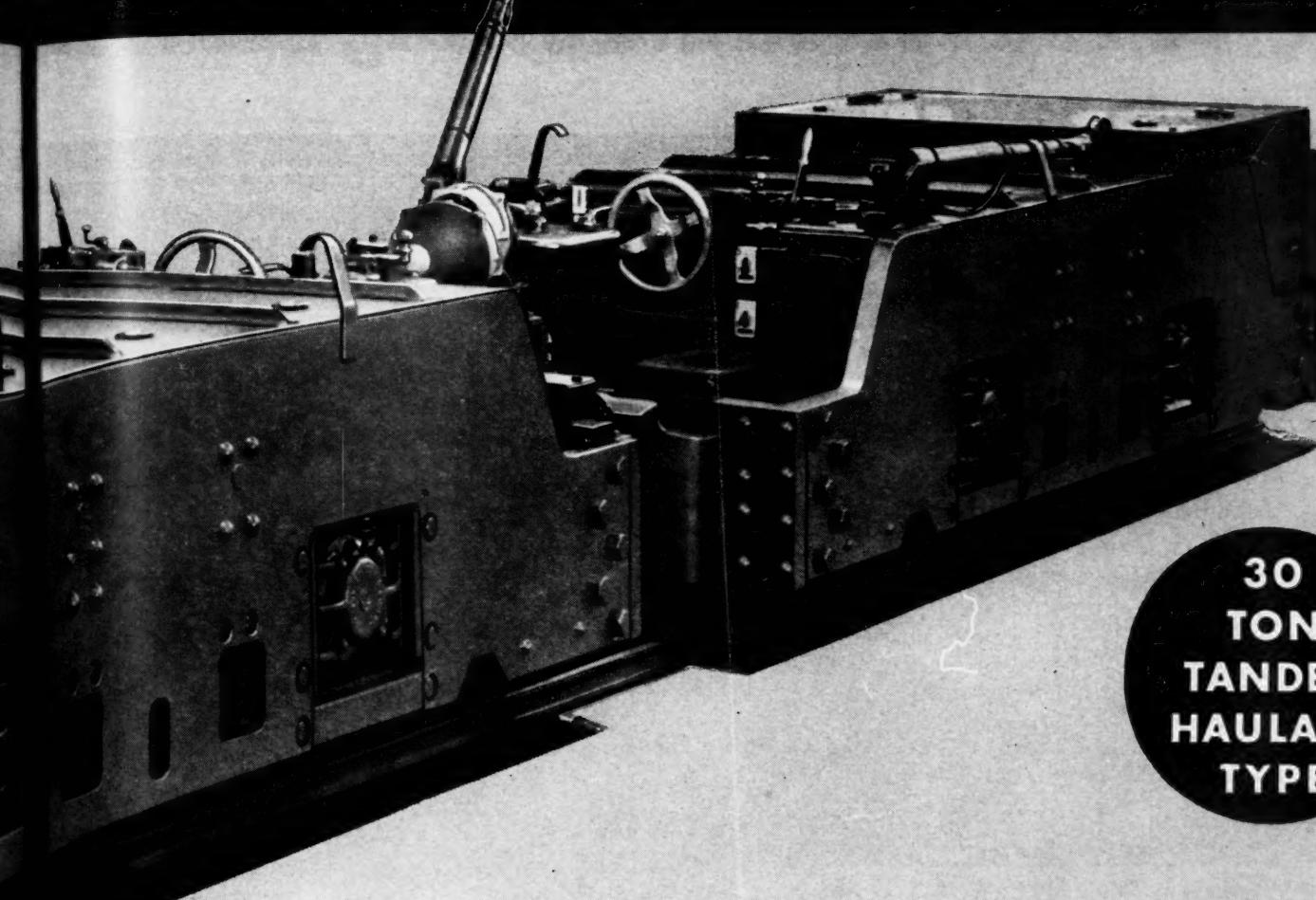
# COAL IS VITAL....



## JEFFREY LOCOMOTIVES

**Trolley, Cable Reel and Storage  
Battery Types—and Trammers**

# ...KEEP IT ROLLING



30  
TON  
TANDEM  
HAULAGE  
TYPE

To adequately meet the urgent need for coal, Jeffrey offers a size and type locomotive for every mine transportation service.

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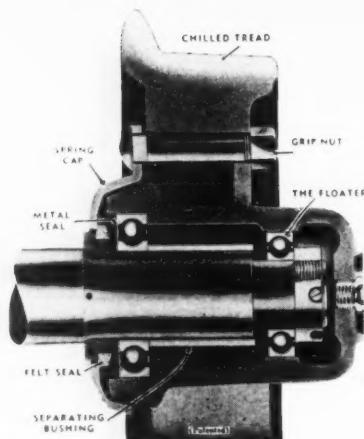
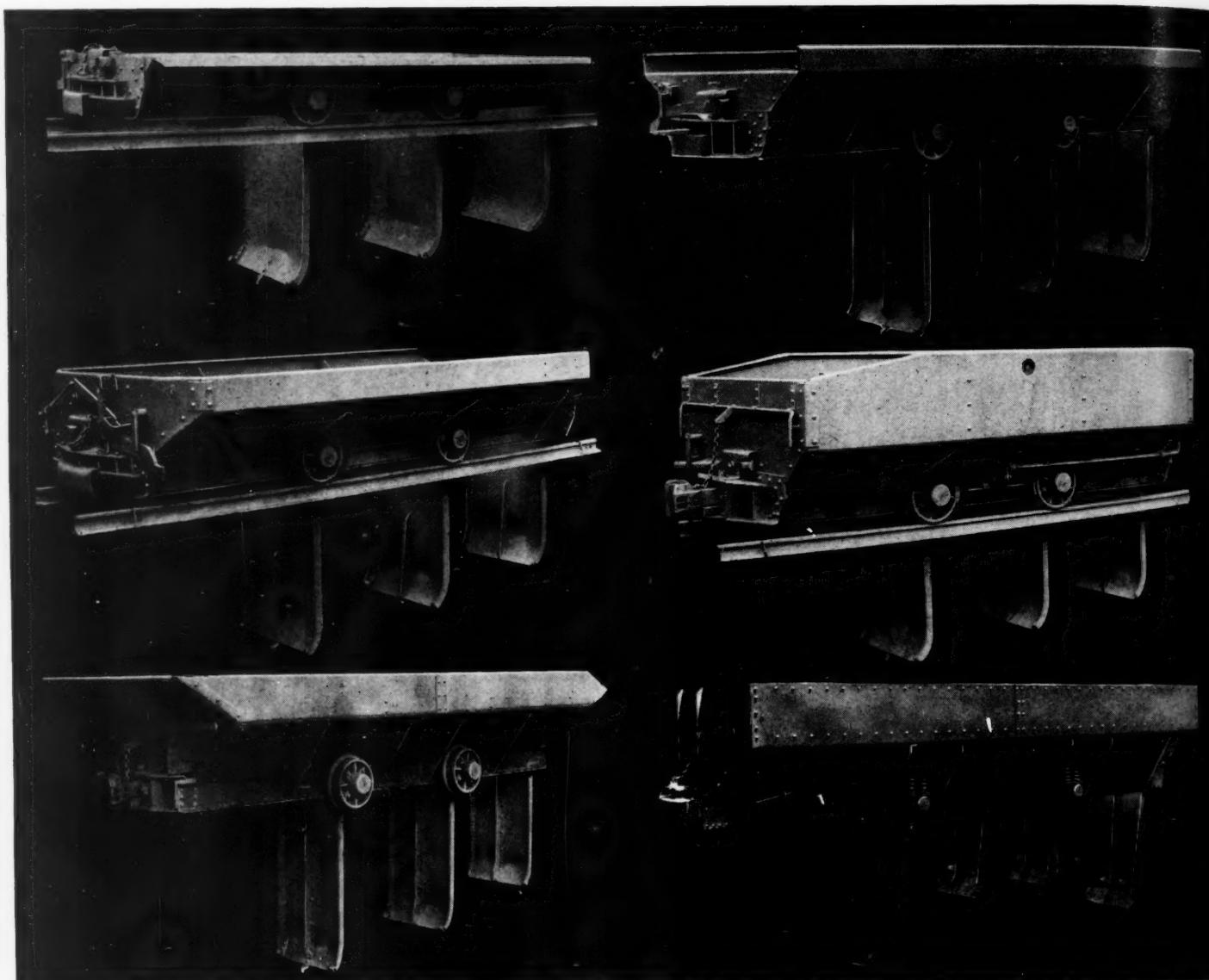
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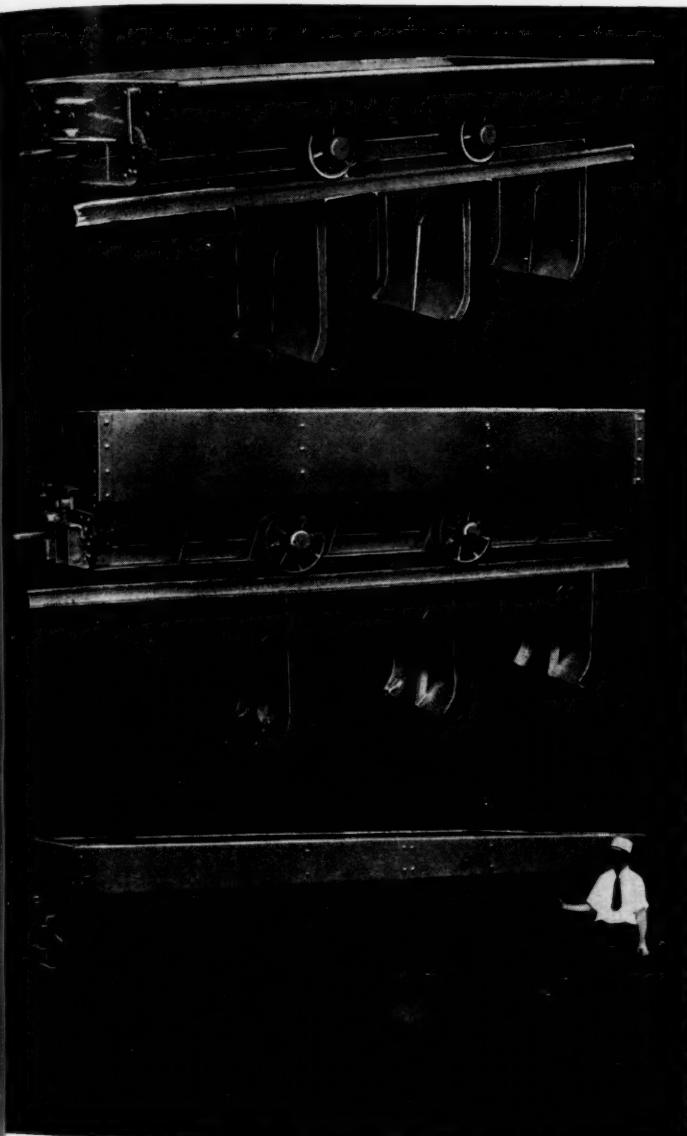
# Here Are The Cars That Are Production...Cutting Costs D



## No Mine Car is operating at minimum cost without S-D "Floater" Wheels

• Compared with other types of precision bearings, you can save up to 33 percent in power alone. Independent Engineering tests have proved such savings. A recent test showed a cash savings of \$5.51 per car per year. The effective haulage capacity of the locomotive was 49.5 percent greater when pulling cars equipped with "Floater" Wheels. Furthermore, S-D "Floater" are guaranteed against breakage or bearing failures for 5 years, and if you have to grease "Floater" more than once in 5 years, we pay the extra cost. It's such performance as this, that we guarantee, that is causing hundreds of smart operators to change over to S-D "Floater." Copies of engineers' tests sent on request.

# Increasing Essential Coal Keep and Conserving Man Power!



## — and all are S-D "AUTOMATICS"

● An S-D "Automatic" is not just a standard stock car. Every S-D "Automatic" is built special to exactly fit the need of the particular operation it must serve. Dimensions, capacities, loading problems, distances of haul, and many other conditions are involved. The one feature of an S-D "Automatic" that always is standard . . . that means tremendous increases in production . . . great decreases in operating costs . . . big savings in man power . . . is the exclusive S-D 1-2-3 "Automatic" method of dumping.

Wherever there is a coal field, you'll find the S-D "Automatic" and its modern system of operation saving from 10 to 40 cents per ton of coal hauled, as compared with old methods and, in addition, you'll find production increases of 24 percent and up.

If you plan to purchase mine cars, even within the next 12 months, investigate S-D "Automatics" now! The cars shown in this ad are just a few, ranging in capacity from  $1\frac{1}{2}$  to 10 tons, which we have built recently. Write to us for a list of users. Let them tell you in their own words what S-D "Automatics" have meant to them in terms of more production, less cost, and saving of man power.

## You can have S-D "Automatics" in your mine on a Liberal Rental Plan!

You may have all the advantages of S-D "Automatics" on a liberal rental basis, and the average rental cost over a 15 year period will be less than 2¢ per ton on the coal hauled. Free maintenance parts for car bodies are supplied under contract for several years period. For the same period, grease is supplied free where S-D "Floater" Ball Bearing Wheels are used. Ball bearings and wheel castings have separate guarantees for five years use. All the time, you will have an option to purchase the cars and terminate the rental contract.



*Sanford-Day Iron Works, KNOXVILLE, TENNESSEE*



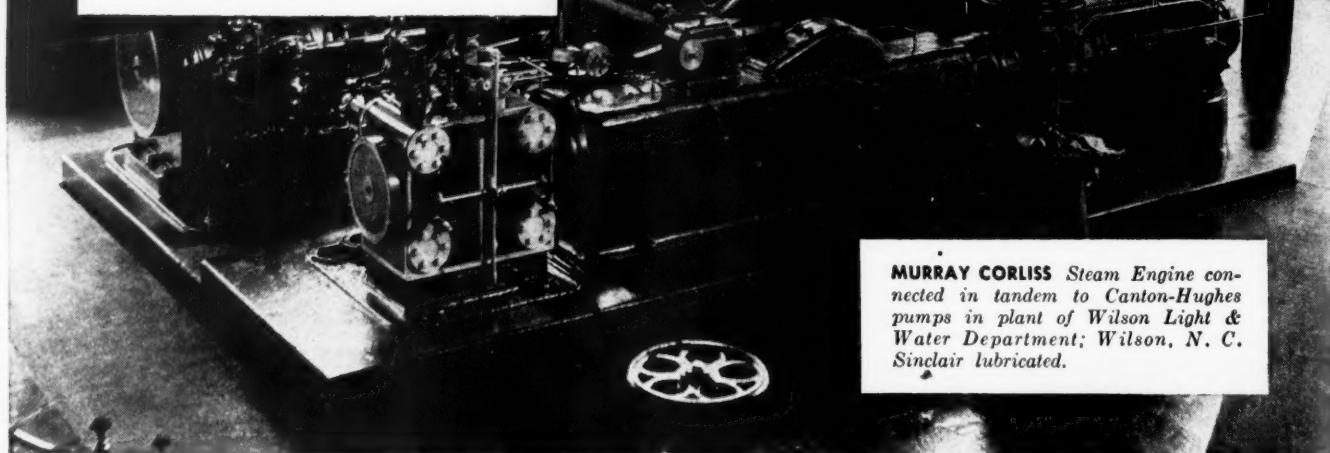
### WINNING EFFORT

demand every ounce of horsepower. **STEAM ENGINES** deliver sustained full power output when lubricated with

### ...SINCLAIR STEAM CYLINDER and VALVE OILS.

**These oils meet every combination of speed, pressure, temperature, moisture condition and steam recovery requirement in power house operation.**

*Write for "The Service Factor"—a free publication devoted to the solution of lubricating problems.*



**MURRAY CORLISS** Steam Engine connected in tandem to Canton-Hughes pumps in plant of Wilson Light & Water Department; Wilson, N. C. Sinclair lubricated.

# SINCLAIR INDUSTRIAL OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE NEAREST SINCLAIR OFFICE  
SINCLAIR REFINING COMPANY (Inc.)

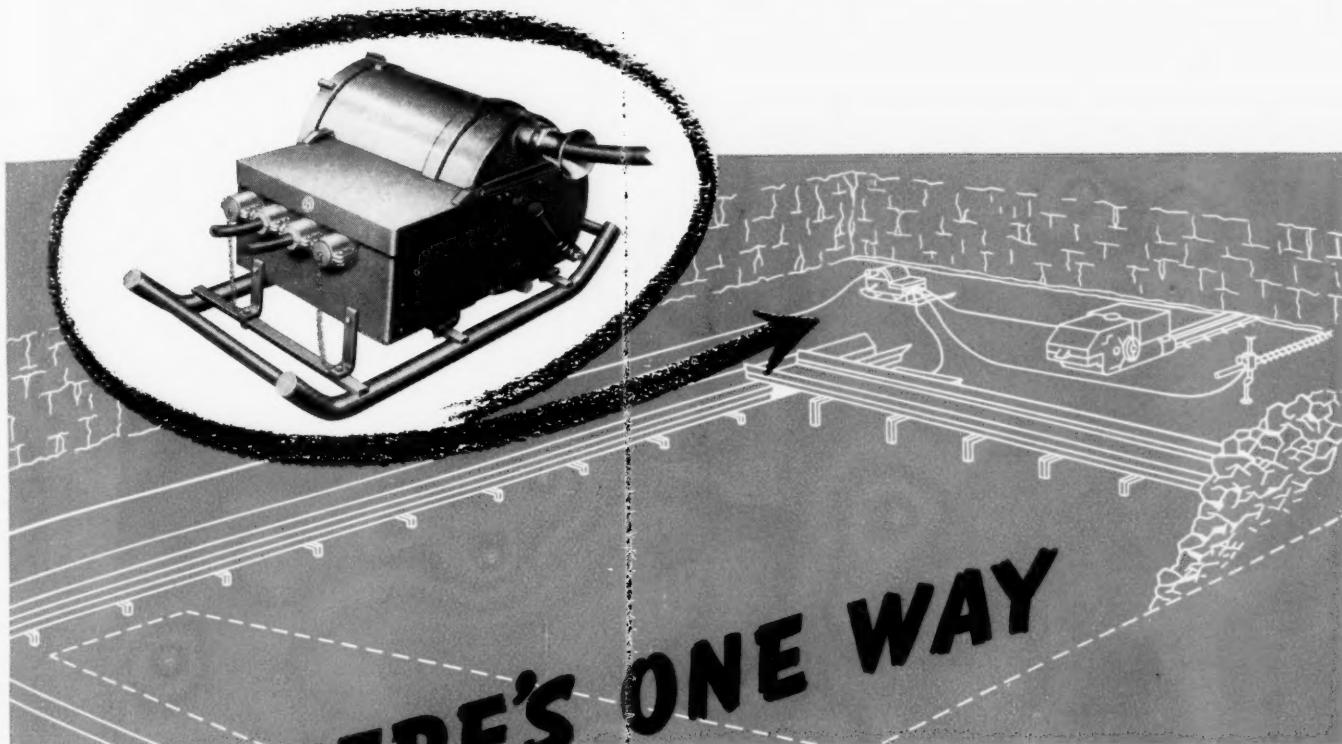
2540 WEST CERMAK ROAD  
CHICAGO

10 WEST 51ST STREET  
NEW YORK CITY

RIALTO BLDG.  
KANSAS CITY

573 WEST PEACHTREE STREET  
ATLANTA

FAIR BUILDING  
FT. WORTH



## HERE'S ONE WAY

**the O-B type GM permissible distribution box will fit into your gaseous mining picture**

Want to provide a safe, fool-proof means of connecting face circuits in your gaseous working areas? Furnish fused overload protection to your face machinery cables? Eliminate all but one cable running into the face area?

Solve these connection and protection problems by installing the Type GM Permissible Distribution Box. Approved by the U. S. Bureau of Mines, this device is tamper-proof, convenient and ruggedly built. Every construction detail has been planned to meet the most rigorous service requirement.

While the above installation is but one application, there probably are countless other places in your mine where you could use the Type GM

Permissible Distribution Box to advantage. Write today for more detailed information—or better yet, see your O-B representative and find out just how this modern explosion-proof device will help you to mine more coal, faster!

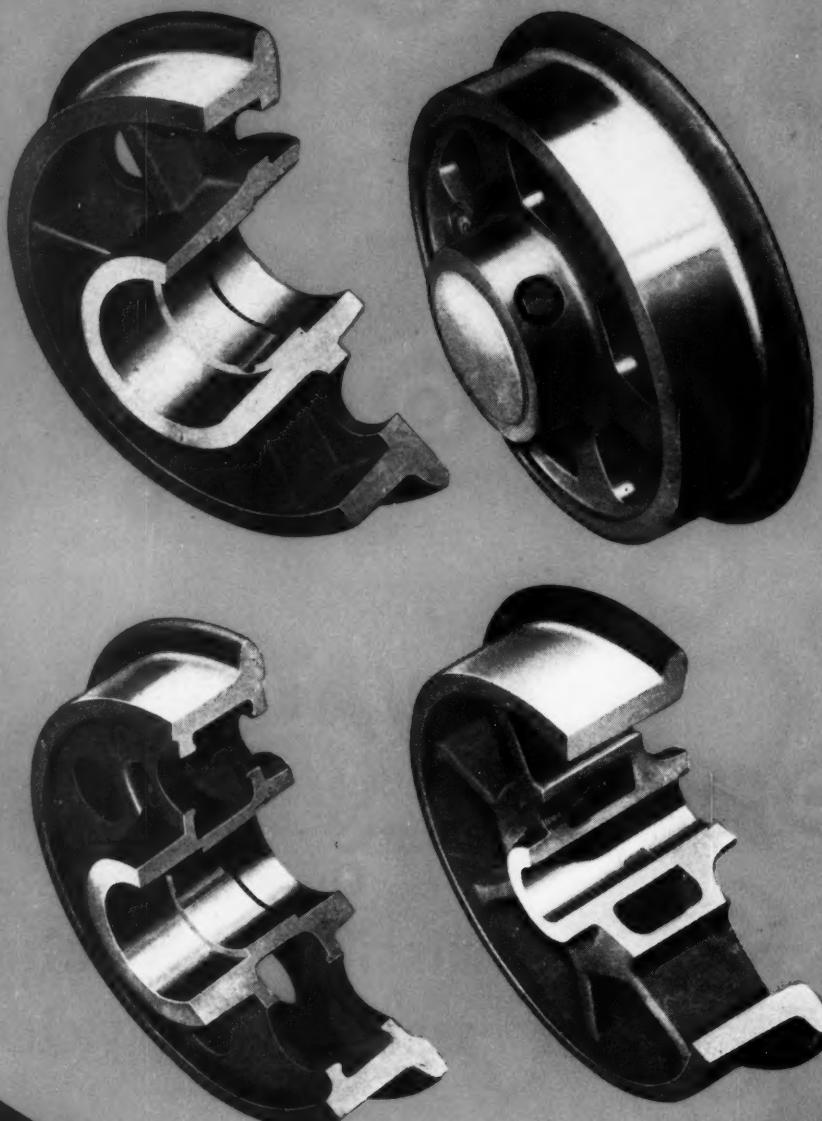
### ANALYZE THESE FIVE FEATURES

1. Individual fuse protection for each face circuit.
2. Fast, convenient connections for four circuits.
3. Safe, fool-proof, interlocking switch and case.
4. Skid mounting for portability.
5. Rugged, "man-proof" design and construction.

2290-M

**OHIO B BRASS**  
MANSFIELD  
Canadian Ohio Brass Company, Ltd. Niagara Falls, Ont., Canada

**BUY United States Defense Bonds and Stamps**



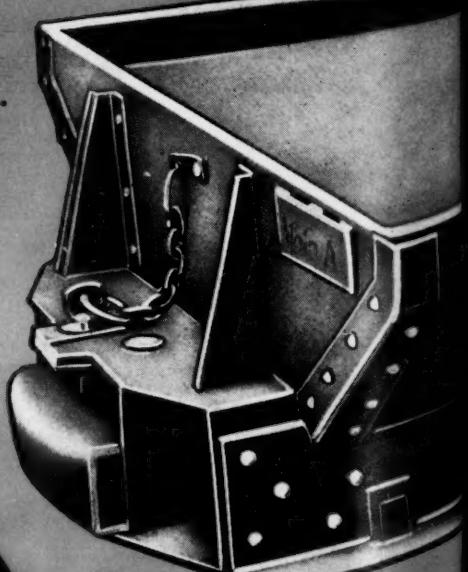
Drop-B



# a.c.f.

**AMERICAN CAR AND  
FOUNDRY COMPANY**

New York • St. Louis • Chicago • Philadelphia  
Berwick, Pa. • Pittsburgh • Cleveland • Huntington, W. Va.



# Bottom Cars that WORK

If you prefer drop bottom cars, here is one that works . . . —

It is built strong and has everything; and operates at the lowest

possible cost . . . — It has large capacity and A.C.F. wheels,

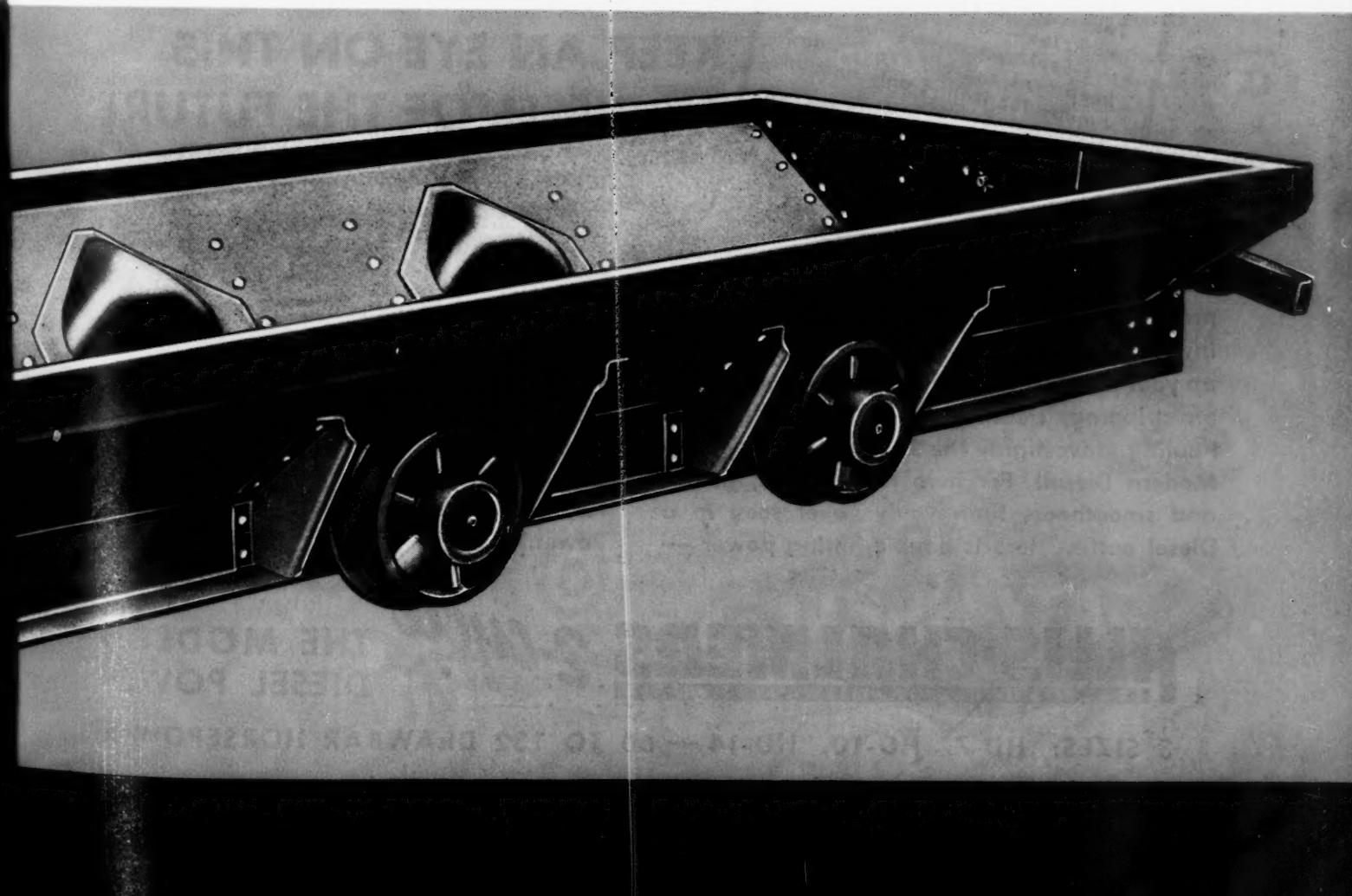
made under A.C.F. Heat Treating Process of manufacture; also

electrically welded end-sill construction, double acting spring

bumper . . . — Doors latch and stay latched and coal is not lost

all along the tracks . . . — If you are interested in Drop Bottom

Cars, let us show you how these work in actual operation . . . —





"We think a lot of this tractor," says Buckeye Coal Mining Co., Lisbon, Ohio — owner of this HD-7. "It's busy all the time, handling a variety of jobs." Takes on the toughest kind of work, too — as illustrated. Positive-Seal truck wheels and idlers keep mud and grit out . . . and require lubrication only once in 200 hours.

## KEEP AN EYE ON THIS DIESEL OF THE FUTURE

While you are in there "all out" for Victory now . . . make your plans for improved, lower cost mining methods tomorrow. Investigate the tractor that's going to speed up your production and give you more economy on stripping, cleaning-up, road-building and hauling. Investigate the 2-Cycle Diesel . . . the Modern Diesel! For here is more zip, power and smoothness than you've ever seen in a Diesel outfit. Here is double-hitting power —

power every down stroke! Here is operation on ordinary Diesel fuels, plus electric starting, throttle control! Here is a Diesel with a new kind of engine . . . an engine with a simple, unit injection system instead of a complicated fuel pump system, a more simply constructed engine with fewer parts to go wrong, with less shock load, less vibration, that's easier on all engine parts and the entire tractor. It will pay you to get all the facts on this Diesel of the future. Write for our booklet, "Modern Tractor Power." Do it . . . Now!

**ALLIS-CHALMERS**  
TRACTOR DIVISION • MILWAUKEE • U. S. A.

*2-cycle* ...

**THE MODERN  
DIESEL POWER**

3 SIZES: HD-7, HD-10, HD-14 — 60 TO 132 DRAWBAR HORSEPOWER

# THE RUBBER SHORTAGE IS MORE CRITICAL THAN YOU THINK

*Numerous industrial rubber products now irreplaceable—except on highest priority. Crisis leads many industries to adopt G.T.M. Conservation Plan for extending life of present equipment*

DURING the past few weeks thousands of plant engineers, production and maintenance experts from America's leading industries have enthusiastically approved a conservation program, to relieve the acute rubber shortage, presented at a series of nation-wide meetings held by the G.T.M.—Goodyear Technical Man.

To these key operating men the importance and necessity of an immediate, all out, rubber-conservation drive was emphasized by facts like these—

Many mechanical rubber items of wide use are no longer being made by any manufacturer.

Even goods sold on priority must now be built to wartime specifications that limit rubber content to less than standard prewar construction.

So critical is the shortage, reclaimed rubber is now on allocation. Practically all synthetic rubber is being used in military equipment.

Most serious of all, several million dollars worth of industrial rubber goods now in use will fail PREMATURELY this year through improper operation and care, judging by past experience. This will deprive plant operators of from 25% to 50% of the full performance built into these products—an irreplaceable loss to the nation.



*COMPLETE MANUAL ON THE PROPER USE AND MAINTENANCE OF INDUSTRIAL RUBBER PRODUCTS—furnished free to your designated operating men.*

#### THE G.T.M. INDUSTRIAL RUBBER CONSERVATION PLAN

The G.T.M. offers a complete, workable conservation program, based on long experience, for eliminating this unnecessary waste and insuring optimum performance from all industrial rubber products.

In factories large and small, operating men are now being taught how to prevent abuses, how to correct improper applications, how to make minor repairs that will prolong the life of industrial rubber products by means of—

“Goodyear Wages War On Waste”—the graphic educational slide film which presents easily and clearly, recommended conservation practices.

Practical demonstrations on how to inspect, what to look for and what measures to take to correct,

how to salvage hose and belts and give them new and additional use.

“Goodyear Industrial Rubber Products Conservation” manual, the concise 40-page, profusely illustrated G.T.M. handbook with practical ideas and suggestions.

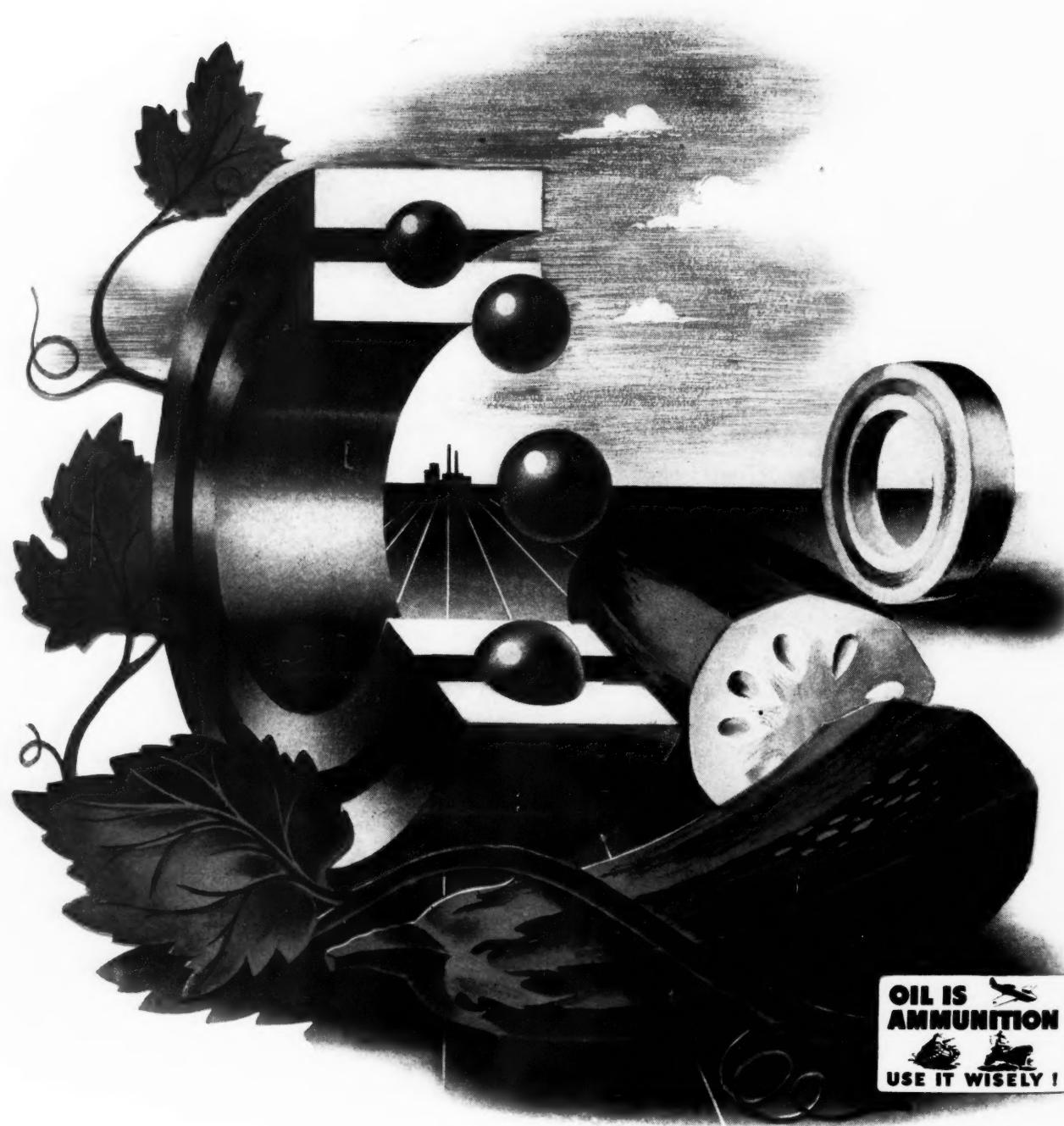
*Industry-wide adoption of this program would mean a minimum saving of many million pounds of rubber products this year—products that many plants will not be able to replace.*

#### HOW TO GET YOUR PLANT STARTED

The G.T.M. will be glad to present the complete program—film, demonstrations and manual—to your plant group. If you will write us, we will set a definite date for the G.T.M. to hold a meeting at your plant. If not possible to hold a meeting, write for manual. The sooner you start the program, the more benefit you will derive from it. There is no charge for this service—it is part of Goodyear's cooperation in the nation's drive for victory. To arrange your meeting or get copy of manual, write Industrial Conservation Department C-2, Goodyear, Akron, Ohio.



# bearings keep cool



OIL IS  
AMMUNITION  
USE IT WISELY!

# as a cucumber

## since this plant switched to Tycol Green Cast Greases

"We gave Tide Water the toughest lubricating job in our plant, and it is doing it to our satisfaction," declares the chief engineer of this company. "It has smoothed out for us the troublesome problem of lubricating high pressure bearings.

"Never since we started using Tide Water Green Cast Grease have we had a single bearing overheated — even though we have been operating 24 hours a day, six days a week. Our greasing problem has been reduced to simply filling the cups once every eight hours."

If lubricating problems hamper sustained operation in your plant, call in a Tide Water engineer. He will study your problem and recommend the proper Tide Water lubricant "engineered to fit the job." Write today for complete details to Tide Water Associated Oil Company, 17 Battery Place, New York, N. Y.

### DRUMS! DRUMS! DRUMS! DRUMS!

War needs make it extremely important that all empty drums be returned immediately.



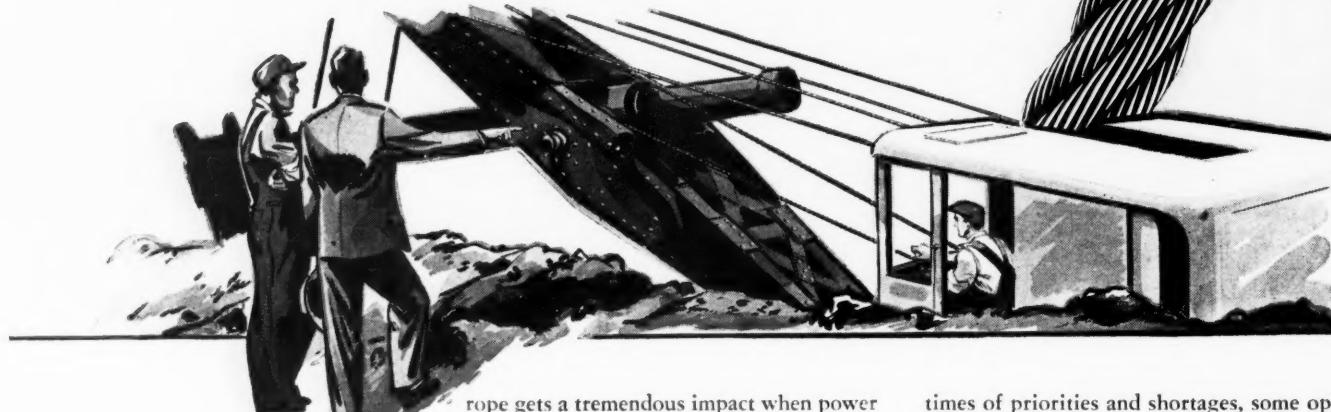
### TIDE WATER ASSOCIATED OIL COMPANY

EASTERN DIVISION: 17 BATTERY PLACE, NEW YORK

Regional Offices: Boston, Philadelphia, Pittsburgh, Charlotte, N. C.

MAKERS OF THE FAMOUS VEEDOL MOTOR OIL

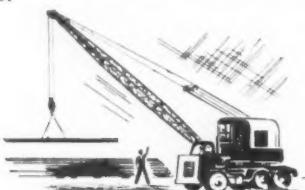
**"It's up to his skilled hands  
to get every hour of extra  
rope service we put in . . .**



Here are some helpful tips you can pass along . . . things that mean even longer life for Roebling "Blue Center" Steel Wire Rope . . . steel saved for U. S. at War!

**Lesson One:**—take a piece of string and pull it gently . . . you'll find it will stand an unusual strain before breaking. But snap the same string quickly and it's easily broken.

Same thing applies to a wire rope. In any kind of hoisting operation, it's vital that the rope should have no slack at the beginning of the lift—else the load might be applied suddenly and then the impact on the rope will be greatly in excess of weight of the load being handled. So *don't jerk your ropes.*



**Lesson Two:**—a hammer weighing only a few pounds can produce a blow having the force of a couple of tons. The load on a wire rope is like a hammer—striking a blow on the rope whenever you start the load too quickly. Even without slack, the

rope gets a tremendous impact when power is applied too fast—as in the case, for instance, when the operator of a shovel moving a boulder tries to knock it out of the way instead of easing it out.

And it's the same when the rope is going the other way. When even a light load is stopped suddenly while being lowered, the rope is subjected to a much greater strain than the equipment could ever apply to it in hoisting. So *don't jolt your loads.* Brakes should be applied smoothly and uniformly, and at the slightest sign of "grab" should be eased off. Brake your load over a longer period and your rope will last over a longer period.

In general, shock loads will remove from the rope the very elasticity that is put in to absorb normal impact, while careful handling will preserve the rope's elasticity and keep it in condition to deliver long life. Of course, the way a machine is run always affects its general maintenance. It's a well-known fact that some people are harder on machinery than others. An operator can push a machine (and a rope) just so far to get extra work out of it—beyond that, the punishment takes its toll of both the machine and the rope—and breakage begins to cost more than the extra work is worth. But in these days when rope steel is vital to the war effort, *wire rope must not be abused.*

**Lesson Three:**—a pitch-fork was not made to shovel sand. Likewise, "borrowing" ropes is very seldom practical. In these

times of priorities and shortages, some operators have been "borrowing" ropes from one operation and installing them on another.



Before you "borrow" a rope, make a careful analysis to see whether you won't get better ultimate economy out of putting the right new rope on the equipment that needs it, and taking the necessary steps to preserve the used rope and make it last on the job it's now doing.

Roebling "Blue Center" Steel Wire Rope is made to deliver a long lifetime of service—it has built a reputation for just that, wherever wire rope has a routine or unusual job to do."



JOHN A. ROEBLING'S SONS COMPANY  
TRENTON, NEW JERSEY  
Branches and Warehouses in Principal Cities

More ways to help you conserve wire rope coming in this space next month.



**ROEBLING**  
"Blue Center"  
STEEL WIRE ROPE  
PREFORMED OR NON-PREFORMED

TO HELP INCREASE PRODUCTION

# TO HELP YOU NEW SUPERLA MINE LOADER LUBRICANTS

*Just when you need them most...*

**A COMPLETE LINE TO HANDLE  
ALMOST ANY CONDITION IN  
LOADER LUBRICATION**

## **SUPERLA MINE LOADER LUBRICANTS**

Four scientifically blended thickened oils for gears, clutches, transmissions and bearings.

**No. 3**—A dripless oil for fairly tight gear cases.

**No. 5**—A fibrous structure thickened oil for gears and transmission. Particularly useful in reducing consumption.

**No. 6**—A smooth type thickened oil for gear cases and gathering head pots. Can be applied with pressure gun for bearings.

**No. 8**—A heavy thickened oil for armature bearings and make-up in cases requiring a leakproof lubricant.

**INDOILS**

### Three grades of straight mineral oils for hydraulic systems.

No. 95 } Provide a range of viscosities  
No. 75 } to meet all loader hydraulic  
No. 41 } system requirements.

**811 IS AMMUNITION USE IT WISELY**

- **WHEN EVERY TON** of output is needed—when every possible minute of production from loaders and cutters counts—these new loader lubricants are just what you need to cut down lost machine time and lost man hours for lubrication and maintenance.

#### HERE ARE JUST A FEW REASONS WHY:

**I** **They meet all operating needs**—Superla Mine Loader Lubricants—not one, but four grades of thickened oils—provide the exact qualities to meet each operating condition more accurately. New or worn equipment—various makes and sizes of loaders—whatever the requirements, one of these lubricants will meet them.

**2 They resist heat**—The oils used in the manufacture of these lubricants have unusually high viscosity indices—that means they do not thin out excessively at high temperatures, and they give added protection to gears and clutches under severe operation.

**3 They reduce maintenance time**—The slightly heavier consistencies of these lubricants reduce both wear and consumption. Idle machine time for lubrication and repairs is reduced to the minimum.

**4 They do not thicken or separate**—All grades of these thickened oils have high stability, which means they do not oxidize or form excessive carbon or sludge deposits in clutch cases. There is no separation of heavy constituents of the lubricant to cake on plates or gear cases.

Prove these qualities in your equipment. Arrange, today, to have a Standard Lubrication Engineer help you make a test. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago, Illinois, for the Engineer nearest you.

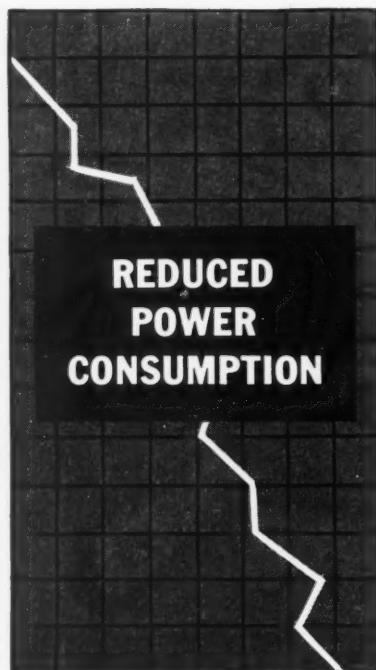
Copy, 1942, Standard Oil Company

# STANDARD OIL COMPANY (INDIANA)

LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRICATION

SOCONY-VACUUM'S FAMOUS LUBRICATION

# Capacity



The "4-Factor" Story proved in Peacetime—Now vital in Wartime



NEVER BEFORE IN U. S. A. HISTORY has there been such grim, absolute necessity for Correct Lubrication. It's a keystone in our Battle of Production. Without it no plant can achieve full efficiency.

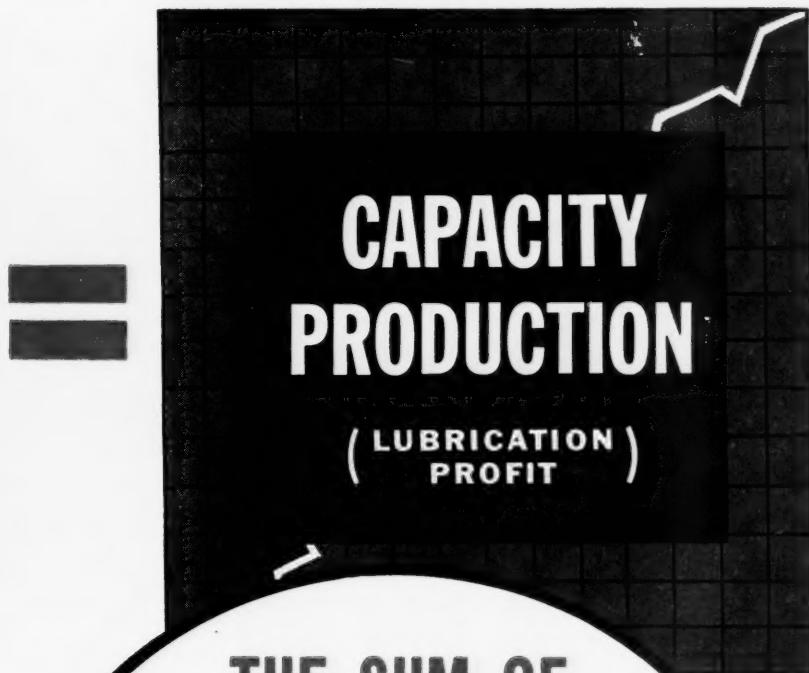
For years Socony-Vacuum—the *first to present and apply the principle of Correct Lubrication*—has been proving to management that it results in 4 savings which add up to a Lubrication Profit. Today, this Lubrication Profit pays off in Capacity Production!

If you are interested in results, talk this over with the Socony-Vacuum man. Backed by 76 years' experience, no one in the lubrication field is better equipped than he to give you the results you want!

**CALL IN SOCONY-VACUUM FOR CORRECT**

**PROFIT NOW PAYS OFF IN ...**

# Production!



**Socony-Vacuum's  
4-FACTOR STORY is a  
Famous guide for operating  
men throughout  
U.S.A. Industry**

SOCONY-VACUUM OIL CO., INC. • Standard Oil of N. Y.  
Div. • White Star Div. • Lubrite Div. • Chicago Div. • White  
Eagle Div. • Wadham's Div. • Southeastern Div. (Baltimore)  
Magnolia Petroleum Co. • General Petroleum Corp. of Calif.

## THE SUM OF THESE FOUR SAVINGS

1. REDUCED POWER CONSUMPTION
2. MORE CONTINUOUS PRODUCTION
3. DECREASED MAINTENANCE
4. LOWER LUBRICATION COSTS

**4 = LUBRICATION  
PROFIT**

**LUBRICATION**

# This "War Machine" will never see the front!



Giant shovels like this one are playing a vital role in our nation's coal production . . . with the help of electricity and dependable wires and cables to carry it.

TO KEEP coal production steady, operators use large quantities of electrical power . . . delivered through modern research-built wires and cables like Anaconda's tough, rubber-saving Duracord\* and it's all-rubber companion, Sunex Securityflex\*.

Of particular interest today with the conservation of rubber all-important, is Duracord. This construction was developed during the last war to meet the need

\*Reg. U. S. Pat. Off.

for super-strength cords and cables. Its "fire hose" jacket, woven from long fiber cotton, makes Duracord tough on the outside—the weak spot in most cables.

The Duracord jacket makes possible rubber savings as high as 50% without sacrificing any efficiency. For further information, please write us immediately.

42253  
**ANACONDA WIRE & CABLE  
COMPANY**

General Offices: 25 Broadway, New York  
Chicago Office: 20 North Wacker Drive  
Subsidiary of Anaconda Copper Mining Co.  
Sales Offices in Principal Cities



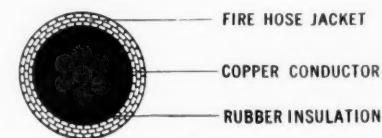
This familiar trade-mark  
symbolizes the best ef-  
forts of modern research  
and production.

## ATTENTION

**Save Rubber with DURACORD  
without Loss of Efficiency**

Here's a way you can effectively conserve rubber supplies and still get long-lived heavy duty electrical cords and cables . . . use Duracord.

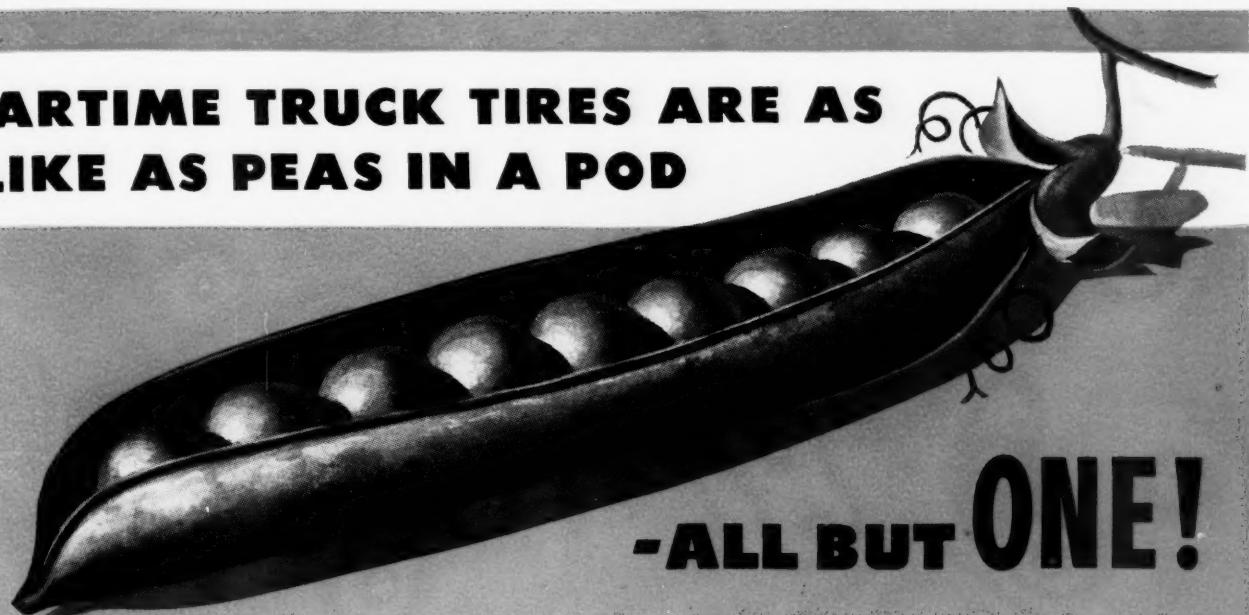
This construction has served in some places for more than twenty years and it is still in use today. It is *not* a new construction.



*Sunex Securityflex and Duracord*

## **ANACONDA WIRE & CABLE COMPANY**

## WARTIME TRUCK TIRES ARE AS ALIKE AS PEAS IN A POD



### -ALL BUT ONE!

Through its proved Heat-Venting principle, The Wartime **SEIBERLING TRUCK TIRE** protects against internal heat—and **SAVES RUBBER FOR VICTORY**

Because America's stockpile of rubber *must* outlast the Japs, the government has standardized specifications for *all* tire manufacturers. That makes *all* wartime truck tires pretty much alike—all but the Seiberling Heat-Vented Truck Tire. To conserve precious rubber, this wartime tire retains its famous Seiberling Heat-Vents. They *expel* dangerous internal heat—the cause of more

tire failures than all other factors combined.

And because *all* wartime truck tires contain less crude rubber and more reclaim—are *less resistant to heat*—than those made before Pearl Harbor, the cooling effect of Seiberling Heat-Vents is more important than ever. Use your next ration certificate for the only wartime truck tire that helps conserve rubber by expelling dangerous internal heat.

#### YOUR TIRES ARE FIGHTING FOR AMERICA... MAKE THEM LAST!

The truck you use is a vital weapon in winning the war. Without it, and the thousands of other trucks, the all-important job of feeding and arming America would come to a standstill. Keep it rolling toward Victory by doing everything in your power to make your tires last longer.

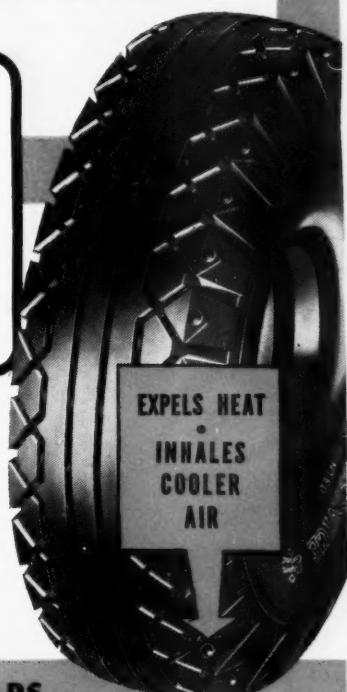
1. Drive only when necessary; conserve vehicle and tires.
2. Drive under 40 miles an hour; speed burns up rubber.
3. Check tires for proper inflation once a week; low pressure may ruin tires and tubes.
4. Have your wheels, brakes, tires and tubes examined regularly by a reputable tire service man; his expert recommendations can give you many extra miles.

## SEIBERLING

*Heat-Vented*  
TRUCK TIRES

MAKE YOUR TIRES OUTLAST THE JAPS...

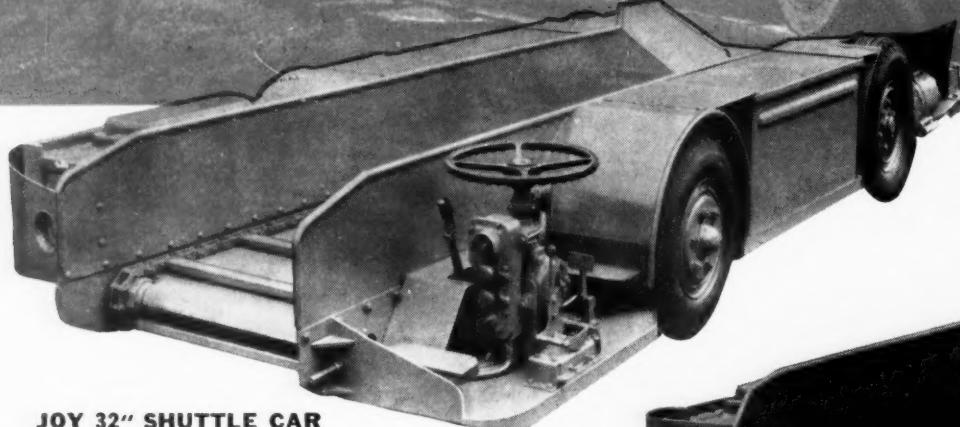
Ask Your Seiberling Distributor about PROTECTIRE SERVICE!



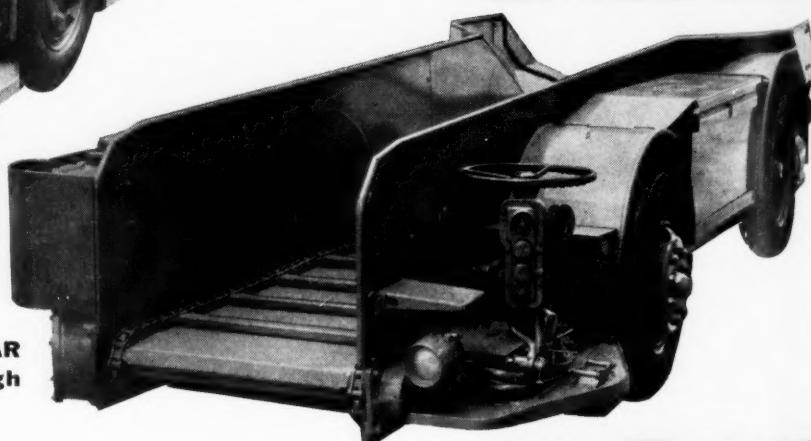
# THE RAILROADS OF AMERICA HAVE BEEN FORCED TO MODERNIZE

The slow, grinding, crawling freight is a relic of the past—  
Today, Modern, Streamlined . . . fast locomotives . . .  
move the nation's freight at a speed that often equals  
the crack flyers—America's Railroads are on the move—  
and now they are really moving!

So it is in coal—leisurely, costly methods are a thing  
of the past. Mechanization speeds up output, modernizes  
methods—lowers costs. A Joy Engineer is available for  
counsel at your convenience.



JOY 32" SHUTTLE CAR  
3½ ton capacity for low  
seam operations.



JOY 42" SHUTTLE CAR  
6 ton capacity for high  
seams.

**THE HORSE AND BUG  
IN THE COAL AND**

**JOY**  
MA



AN BUGGY DAYS ARE OVER  
IN INDUSTRY . . .

**JOY 11-BU LOADER**

A heavy duty machine of  
high capacity, 8-10 tons  
per minute.



**JOY 14-BU LOADER**

A high capacity low vein  
machine . . . only 26" high  
. . . 5 tons per minute.

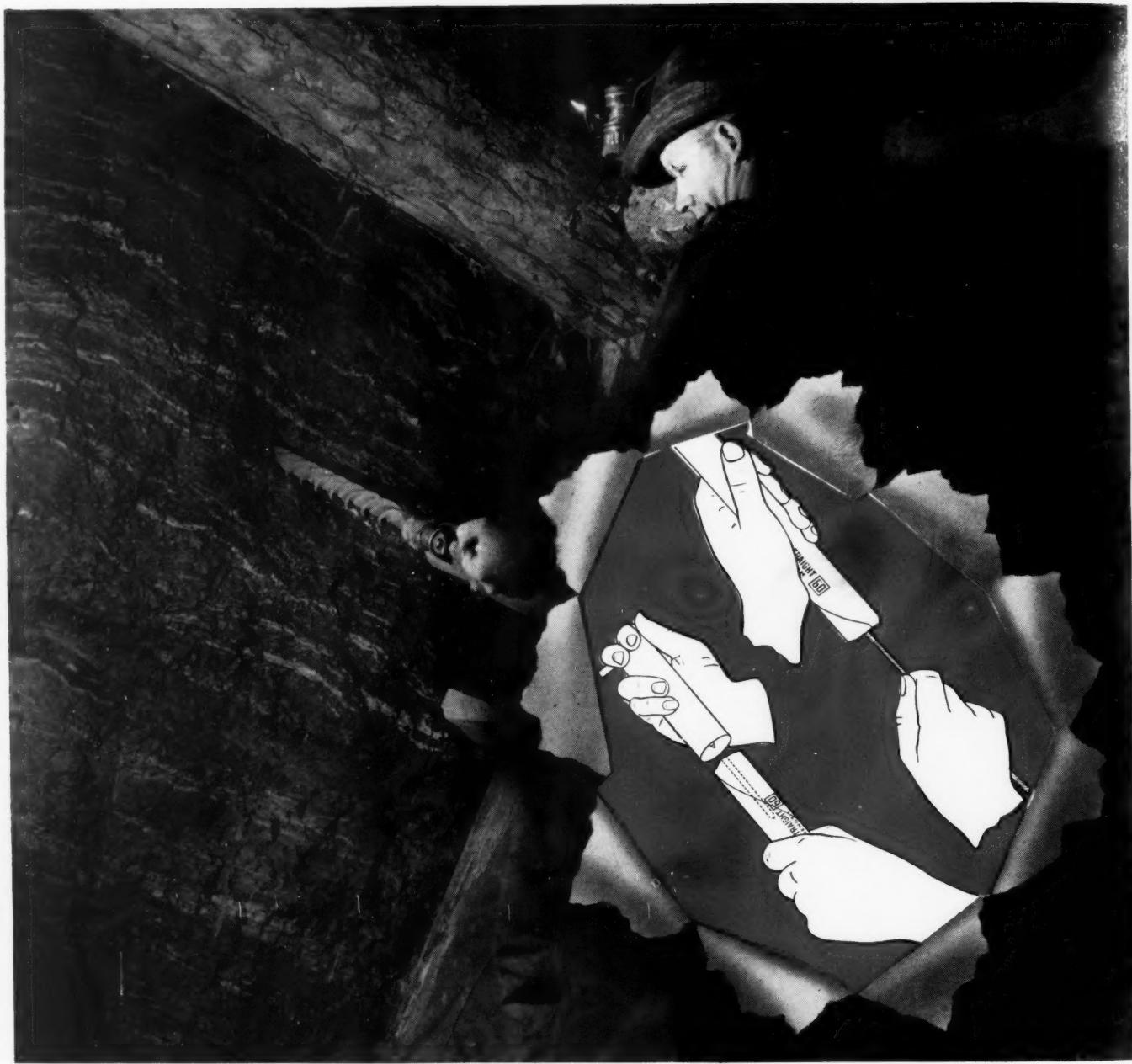


WHATEVER  
YOUR PRODUCTION  
PROBLEM  
MAY BE -



*Consult a  
Joy Engineer*

**MANUFACTURING CO., FRANKLIN, PA.**



Photograph taken in an iron mine

## Use Center Punch for Best Results

The detonating cap belongs midway between the walls of the cartridge, with the business end pointing into the main explosive charge.

The Ensign-Bickford Center Punch places the hole dead center, automatically; and goes to exactly the right depth. It makes a round, clean-cut hole that guides the cap to a snug seating, where it is protected on all sides from abrasion. This protection guards against one cause of premature shots.

For better results in blasting, use Ensign-Bickford Safety Fuse. There's a brand designed to meet the conditions in your mine.

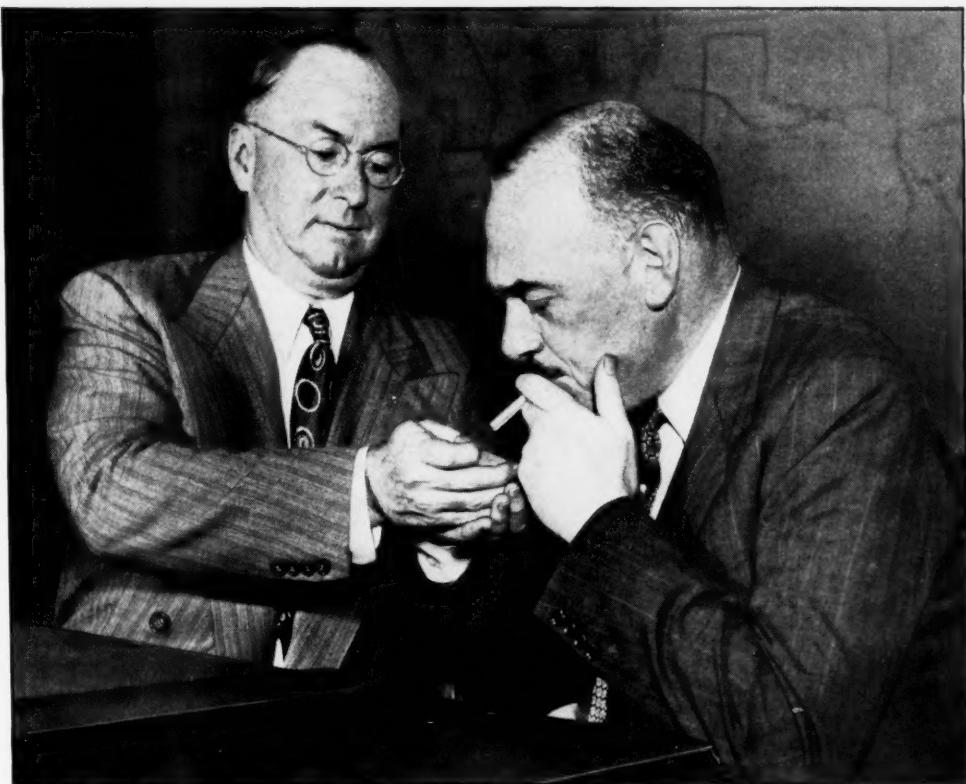
**THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.**  
*Manufacturers of Safety Fuse since 1836—also Primacord-Bickford Detonating Fuse*



SF-126

# ENSIGN - BICKFORD SAFETY FUSE

# The Story That Must Be Told



Two men who know the story best: Donald Nelson, Chief of the U. S. War Production Board, and (right) Oliver Lyttelton, Great Britain's Minister of Production.

BETWEEN THE LINES of today's war news is written a story that is even more vital than the news itself. For through that story we begin to discern the pattern of victory, not yet complete in all its details but increasingly clear in its essentials.

It is the amazing story of how American industry has responded to the call for the weapons of total war, of how its technicians, workers, and managers are driving through an unprecedented task of fantastic size and complexity.

France fell in June 1940. During that month this country produced about \$150,000,000 in war goods. By June 1941 the Nazis had overrun the Balkans; and in that month our war production was \$800,000,000. The fateful month of December 1941 gave us an output of \$1,800,000,000—an increase better than tenfold in eighteen months. And in May 1942 our total expen-

ditures for war equipment and supplies mounted to the staggering total of \$3,500,000,000.

This is an increase of twentyfold within two years, of itself a stupendous industrial achievement. But what is even more important, that achievement already is making itself felt the world over—in the Orient, in Australia, in Libya, in Europe, in the Coral Sea, at Midway Island, at the Aleutians, and wherever else we find a battlefield manned by free men.

To accomplish it, many industries have been pouring out war materials at a rate that only six months ago did not seem even remotely possible. Starting from scratch, our factories have turned from their peacetime jobs, first to meet and then to surpass the most hopeful estimates of what might be expected of them.

To do this they have drawn heavily upon all of their resources. Their skilled and unskilled

man-power has thrown into the task a war-born will to work; their research staffs have bent to it all of their scientific resources; their engineers have applied to it their utmost ingenuity; their executives have devoted to it the full measure of that managerial skill which has won for American industry the respect of the modern world.

For the first time in history we have pushed the accelerator of the world's greatest engine of mass production down to the floorboard. Always in times of peace, factory men have had to gear production to what the markets would take. But now the market they are called upon to serve is hungry for the last ounce of potential output. For war confronts industry with a demand limited only by its capacity to produce.

During these feverish months, while a desperate world has watched breathlessly to see how American industry would perform as the arsenal of democracy, we of McGraw-Hill have followed with mounting pride — at times almost with wonder — a new miracle of industrial achievement.

Some day the full story of this American industrial effort will fill a brilliant chapter in the epic history of our times. Meanwhile it would be premature to celebrate the completion of this task. For victory has not yet been won; that still lies at the far end of a road that we may find to be long and arduous.

But even now we can be certain of one essential of that victory. American industry is doing its job; it is delivering all that the people have asked of it — and more.

As I have watched with my associates the unfolding of this picture, I have wished that it were possible to broadcast it, in full color and wealth of detail, to the people of America, so that they could understand at least, in part, the job their industry is doing for them. It would help, it seemed to me, if the men of industry themselves, each so intent on his own task, knew what their fellow-workers in other fields have been doing.

However, the managers of industry have been far too busy **doing** to talk. They are going to be just as busy for some time to come. Naturally, many details are yet to be spread upon the record and, indeed, the full story cannot be told. But that part of the story that can be told is well worth the telling and the hearing, if only for its revelation of the spirit of an awakened

America, throwing its all into the fight against the tyranny that has brought so many of the world's little people under its heel.

*The 1941 war production of the United Nations, exclusive of the United States, equalled the total 1941 war output of Germany with all of its captive plants and enslaved labor. Since Germany's 1941 operations were at maximum capacity no further increase is possible. British output has been expanding to the point where its 1942 production is considerably ahead of Germany's.*

*In May 1942 American war production passed the British output 50 days ahead of schedule. In 1943 it will be 3 times that of the British.*

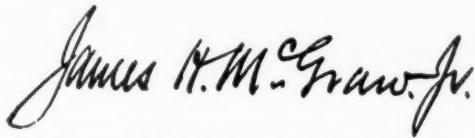
This has been brought about under the leadership of Donald Nelson and the War Production Board, the Army, the Navy, the Maritime Commission, with the cooperation of management and labor. It has been furthered by the cooperation of Oliver Lyttelton, British Minister of Production, and other British production authorities.

But the story goes far beyond that. It gives us a glimpse of the America as it will emerge from this war, its industries again setting world standards of production, which will become the spearhead of our post-war economy.

This is a story that cannot be adequately told in generalities. It must be told in some detail. For instance, the great accomplishments of the machine tool industry, the great forward strides made by the aviation industry, the tremendous achievements of the chemical industry, the amazing conversion of many industries will warm the hearts of Americans.

These aspects of the subject deserve the fullest treatment and will be told month by month in these pages until the story has been completely unfolded. We will try to give a concise overall picture of the war job that industry has done and still is doing. You will find it a thoroughly American story of high American achievement in which every American can take pride and from which every American can take hope for the future of his country.

The story is far too significant to be withheld any longer.

  
President, McGraw-Hill Publishing Company, Inc.

# Coal Age

## *Editors look at the News*

### Conversion and Stocking Pressed To Meet Fuel-Oil Shortage

**Stoker and Grate Restrictions Eased—Steps Taken to Promote Coal Movement—Early Coal Purchase and Storage Urged to Meet Oil Shortage—Order Placed for Pipe for Oil Line From Texas to Illinois**

KEEPING the country warm, especially the eastern seaboard, became a matter of increasing concern in June. Heavier stress was laid on converting heating and power equipment to coal and on stocking the latter (or at least placing orders so that plans may be made for delivery) while a good opportunity still is available.

Priority regulations were eased to facilitate conversion and the installation of coal-burning equipment, although at the same time permission was given the production of "Class A" oil burners to fill orders bearing an A-10 rating. Last, but not least, construction of an oil line from Texas to Salem, Ill., was authorized as one step in meeting the shortage in the East.

#### U. S. Agencies Push Conversion

Evidence of the pressure behind the drive for conversion is afforded by news and pictorial releases by government agencies. The accompanying illustration, released by the Office for Emergency Management, Division of Information, OPA Section, is a typical example. It shows a mechanic installing grates to convert a heating system from oil to coal in a two-family house in West 59th St., New York City. The oil burner, discarded for the duration, is on the floor. A two-family furnace like the one shown, the release points out, uses an average of 83 bbl. of oil a year, whereas a destroyer cruising 1,000 miles and back at 15 knots will use 1,700 bbl. of oil—or the equivalent of the

consumption of 40 families a year. Prompt change-over to coal, plus ordering coal now, is a patriotic step, says OPA.

To speed conversion, the OPA Consumer Division has reported that grates for furnaces, boilers and stoves now may be obtained without priority ratings by home owners. Before the previous WPB plumbing and heating restriction order was amended, purchase of grates valued at more than \$5 retail required an A-10 or better rating. This was followed by the creation of an Operations Branch in the WPB Plumbing and Heating Branch to study the problems involved in conversion.

Permission for the assembly of small stokers through Amendment No. 1 to Limitation Order L-75 is

another step that has been taken to facilitate conversion. The original order ended the production of such units on May 31. Through the amendment, production of these stokers from fabricated parts in the manufacturer's possession on May 31 is permitted until Sept. 30. Order L-79 also has been amended to permit dealers to sell and deliver, without priority, all stokers now in their hands, as well as any additional stokers (60 lb. of coal per hour or less) which the manufacturers are able to ship them from now on. This, it is estimated, makes 70,000 units available for conversion purposes. Allocation of sufficient pig iron and scrap for grate manufacture also is being studied, and a number of foundries already are producing a special grate designed to fit all types of small furnaces and boilers.

#### Canada Also Converts

The trend also is to coal, including cooking and hot-water heating, in defense housing. In Canada, also, conversion is being accomplished through government regulation and private initiative.

With the possibilities in conversion strictly limited in the opinion of many, such as the New York Oil Heating Association, which places the maximum possible change-over at 15 percent without extensive rebuilding of plants, agitation for additional oil transportation increased. On June 13, Petroleum Coordinator Ickes announced that an order for 550 miles of 24-in. pipe had been placed for an oil line from Texas to Salem, Ill., from which the oil would be transshipped to the East. Capacity of the line, expected to be completed in December, will be 300,000 bbl. daily. Present oil deliveries to the Atlantic Seaboard are reported to be 1,000,000 bbl. per day, of which 730,000 are



An example of a conversion job in New York City to meet the fuel-oil shortage as shown in OEM photo.

moved by rail, against essential East Coast requirements for 1,300,000 bbl. per day. Plans for another line across northern Florida (35,000 bbl. per day) were approved by Mr. Ickes June 17.

#### Coal Rate Highest Since 1918

"The coal-supplying industries have been able to take the necessary steps so far to overcome war-time obstacles and keep coal moving at the highest rate this season since 1918," declared a June announcement of a change in the name of the Office of Solid Fuel Coordination to the Office of Solid Fuels Coordinator for War. "The mines and carriers," the announcement continued, "are not only providing coal to meet the current high demands for war industries but they are making large quantities of the fuel available for consumers to build up stockpiles."

Supplementing continued urging of stocking, the coordinator announced early in June that a plant-by-plant study of what the railroads and industries holding war contracts are doing to protect their fuel supply had been launched in conjunction with the War Production Board. WPB Chairman Nelson has asked that these industries report to the Solid Fuels Office immediately the quantity of coal on hand, the possibilities of storing additional coal and other information concerning fuel supply. Mr. Nelson joined with others in urging that all present and prospective consumers, especially large industrial users and war plants, stock coal to the limit.

#### Miners Pledge Support

In the vital work of getting the coal out, the United Mine Workers of America pledged its complete support in June in a resolution unanimously adopted at a special meeting of the policy committee. Referring to estimates that 600,000,000 tons of coal and 70,000,000 tons of coke will be required in 1942, the resolution declared that "we propose to not only meet this goal of our government but to surpass it, and to produce in addition thereto enough surplus coal to bury the Axis powers." In addition, the

resolution supported 100-percent purchase of War Bonds by UMW members and urged use of the payroll allotment plan.

Facilitating the flow of coal also was the major objective in several grants of relief under Maximum Price Regulation No. 120 (Bituminous Coal Delivered From Mines or Preparation Plants), as well as No. 121 (miscellaneous solid fuels from producers) and No. 122 (wholesale and retail solid-fuels prices). Maximums were lifted for a num-

ber of producers throughout the country to permit them to continue to operate or continue to get the same realization. New sizes and qualities of fuels not covered in previous regulations and also fuels not new but which had not been sold in the Dec. 15-31, 1941, price-basing period also were brought under the maximum-price control.

Additional relief was granted to producers shipping to their own docks in the Northeast and distributing from those points under Com-



#### Complete Data Still Essential

*Metals and materials grow scarcer, and as the scarcity gets more acute the need for supplying full information on requirements increases if coal mining is to continue to get its fair share of available supplies. Realization of this fact has motivated COAL AGE in its support of the position taken by the War Production Board and again brought out*

*by Dr. Wilbur A. Nelson, administrator of the Mining Branch, in the letter reproduced herewith. The need for such action is even more critical, for, as Dr. Nelson pointedly states, "without such figures it will become increasingly difficult over the months ahead to maintain the top priority status now set up for all essential mining."*

pensatory Adjustment Regulation No. 1, originally designed to provide for government payment to dealers and distributors of compensation for any extra transportation costs which they might incur because of dislocations in normal tidewater transportation from Hampton Roads in supplying New York and New England. Compensation thus paid, however, must not exceed that actually paid over and above the cost set forth on OPA's "Bulletin of Standard Adjustments."

#### Truck Restrictions Relaxed

Restrictions on truck operation promulgated by the Office of Defense Transportation in May also were relaxed somewhat to facilitate coal deliveries, as well as movement of supplies and equipment to mining properties. At the same time, the ODT ruled that Lake carriers, unless authorized by special or general permits, are prohibited from moving coal from Lake Erie ports to a number of destinations. The object is an increase in facilities for moving an additional 2,000,000 tons of iron ore.

In truck shipping, greatest concern was expressed over the ruling requiring a return load in over-the-road operations, and the effective date of these provisions was deferred from June 1 to July 1 to permit working out plans for taking care of the return-load situation. In retail deliveries, ODT ruled that the 25-percent mileage reduction per ton of coal delivered could be handled on an annual basis.

#### Truck Appeal Boards Set Up

Seventeen local boards of appeal were set up throughout the U. S. by the Office of Defense Transportation to pass on applications for permission to purchase new trucks, these boards to take over the duties of the Washington appeals board. Decisions of the local boards will be subject to review by the Allocations Section of the ODT. Boards are located as follows: Boston, Philadelphia, Atlanta, Columbus, Chicago, Nashville, Kansas City, Little

Rock, Fort Worth, Salt Lake City, Denver, Portland, San Francisco and Los Angeles. Others are being organized in New York, Minneapolis and Charlotte.

#### Keep It Coming

*Developments in the fuel field present both an opportunity and an obligation to coal producers and distributors. The obligation*

*is to see that consumers take their requirements early, with which is coupled an obligation for keeping production going at the maximum rate. Perhaps in the hurly-burly of the war effort, full advantage cannot be taken of the opportunity, but coal is getting its foot in a lot more doors and now is none too early to look into the problem of keeping these new customers on the books from now on, not to mention adding to their number.*

## Control Over Materials Tightened; Mining Companies on Old Basis

### Mining Companies Exempted From New PRP Regulations —New Method of Extending Preference Ratings Adopted —Steps Taken to Assure Supply of Safety Equipment— New Ceilings on Machinery and Supplies.

WITH MATERIALS getting scarcer, new control measures have been adopted by the War Production Board to insure their equitable distribution among consumers, including military and naval establishments. As an example, distribution of welding rods and electrodes was placed under strict control in an order announced June 9.

Rods and electrodes now may be delivered without restrictions only to the Army, Navy, specified government organizations, the lease-lend program and accredited or industrial welding schools. Other deliveries of ordinary rods and electrodes are confined to orders bearing a preference rating of A-9 or higher. In the case of alloy electrodes or rods (ferrous-base types with core wires containing more than 2 percent by weight of materials other than iron or carbon), deliveries may be made only on A-1-j or higher orders.

The order also provides for setting aside each month, for repair and maintenance only, 6 percent of each type of rod or electrode delivered by a manufacturer that month. Also, no one is permitted to acquire rods or electrodes if the result will be to increase inventory over 60 days.

A shift from qualitative control of the priority system to quantitative control under which preference ratings will be granted for only a specific amount of material was effected with the issuance of Priorities Regulation No. 11 in June. It was accompanied by Order No. 10 providing for identifying materials used until they reach the end product for which they are intended. Under the terms of this regulation, companies engaged in the production and distribution of coal and coke are instructed to place the symbol "DP 9.30" on all purchase orders, the "DP" standing for domestic purchaser and the "9.30" for coal and coke. Construction of new buildings and building maintenance and repair take numbers in either the "21.00" or "22.00" classes.

Order No. 11 provides, briefly, that companies using over \$5,000 worth of metal in the third quarter apply for priorities assistance under the Productive Requirements Plan before July 1. Mining companies, however, were among a group exempted from this regulation, although they still are urged to transmit forecasts of their materials and equipment requirements to manufacturers and the WPB Mining Branch. Both mining compa-

nies and manufacturers of mining machinery operating under P-56, P-58, P-73 or P-56A orders, as well as under the general repair and maintenance order, P-100, continue on the same basis.

Delivery of mining machines produced from materials obtained under a preference rating cannot be delivered except on rated orders, however, the Division of Industry Operations ruled June 12, in an amendment to Order P-56-A. The division also announced that material for repair and maintenance of houses owned by a mine operator for the use of employees cannot take higher than an A-10 rating.

#### New Rating Extension Adopted

A new and uniform method of applying and extending preference ratings was adopted in June, rescinding orders requiring the purchaser to furnish his supplier with copies of preference-rating orders or other special certifications. In addition to the standard certification given below, orders on which a preference rating is applied or extended after July 1 must also include identification symbols under the Allocation Classification System established by Priorities Regulation No. 10. The certification is as follows:

The undersigned purchaser hereby represents to the seller and to the War Production Board that he is entitled to apply or extend the preference ratings indicated opposite the item shown in this purchase order, and that such application or extension is in accordance with Priorities Regulation No. 3 as amended, with the terms of which the undersigned is familiar.

The growing pinch in obtaining safety equipment brought a statement from the WPB Mining Branch that mining companies, themselves or through their stores, may apply to Wilbur A. Nelson, head of the branch, for their safety equipment requirements on a quarterly basis. The Mining Branch then will use its best efforts to see that the necessary raw materials, including rubber, are made available to the manufacturer for filling the orders. Applications, it is emphasized, should be limited to minimum quarterly requirements.

Maximum prices on second-hand machinery and electrical products were established July 1 under the

terms of Maximum Price Regulation No. 136. Used processing, mining, construction, electrical and railroad equipment and machinery, together with parts, are covered in the regulation. And on June 3, poles, posts, piling, split stock, mine timbers and similar semi-finished products were made subject to general maximum price regulation.

#### Make It Do

*Mining companies are going to be faced more and more with the*

*problem of getting along on less and at the same time keeping the coal coming. Pointing out that the WPB Mining Branch is finding it impossible in many instances to get steel, copper wire, etc., for the mining industry with any promptness, the National Coal Association declares that "Every company must understand that it is going to have to make the best use out of every piece of machinery it has, and that companies must trade and swap and repair when possible. This goes for the use of rubber and trucks just the same as other necessities."*

## Coal Miners' Part in War Production Pictured by WPB and Pittsburgh Coal

To show more clearly the coal miners' role in the war effort, the War Production Board and the Pittsburgh Coal Co. have joined in a message to the latter's employees. This message has been made up in record form by Pittsburgh Coal to permit playing it for employees at convenient times and places, and consists of a short address, preceded by an announcement, by Wilbur Nelson, administrator of WPB's Mining Branch, stressing the need for sustained output.

Other coal companies, it is stated, may have similar recordings made in the same way as Pittsburgh Coal by applying to the Publicity Branch of WPB, subject to the ability of the Branch to get them out. The transcript of the Pittsburgh Coal Co. recording follows in detail:

ANNOUNCER—We have an important message today from Wilbur A. Nelson, head of the Mining Branch of the War Production Board at Washington. Nelson is a famous geologist with a lot of practical mining experience. He is in close touch with the Army and Navy, and he knows what they need to win this war. Now here is Mr. Nelson to speak for himself.

NELSON—You miners have everything at stake in this war. Though you work in the mines, far from the battle front, you are soldiers just as much as the men who fly our fighting planes and drive our tanks. This war is being fought with masses of machines and tons of high explosives. You are soldiers of production

in a war that must be won first in the mine, the factory and the mill.

You are the men who start the production ball rolling. Without the coal you mine, we could not even start to produce the steel that goes into battleships, tanks and guns.

To keep war production going full blast, we need to mine more coal this year than ever before. We need at least 11 million tons of bituminous coal every week—and so far this year we have fallen short of that goal seven times. For the entire year the nation will require about 572 million tons of bituminous and 55 million tons of anthracite. In other words, total production will have to be at least ten percent above last year's.

Mining a mountain of coal like that is a man-sized job for us all. In Washington, we are doing everything we can to see that you have the necessary machines and materials. But the job is mainly yours. To do it you will have to work every regular working day that you possibly can.

Let's see just what your work means to our fighting men. Take a 35,000-ton battleship, for instance: 40,500 tons of steel are required to make such a ship, because some of the metal goes into scrap. To make every ton of that steel, you men have to dig about a ton of coal. To make the steel for the entire ship, it takes all the coal that 6,750 of you can turn out in one day.

Coal plays an equally important part in the manufacture of other weapons. Every time you dig half a ton, you can figure you are making it possible to produce another 2,000-lb. aerial bomb. When you get out a little over two tons, you make it possible to produce a 16-in. naval shell or an Army "blitz bug."

If you stay away from work for three regular working days, it may well cost

the fighting forces a light tank, because it takes as much coal as you can dig in that time to make the steel that goes into one of those tanks.

What happens if you lose six working days over a month's time? As a direct result of your idleness, the country loses enough coal to make the steel for a 27-ton medium tank.

Coal is necessary even to produce small weapons, like hand grenades. Not much, it is true—something like a pound and a quarter for each grenade. In an average day's work, every one of you digs enough to start 9,600 hand grenades on their way against the Nazis and the Japs.

Each one of our big Flying Fortresses takes 15 tons of steel. That means you have to get out five three-ton mine cars of coal to make the steel for a Fortress.

The railroads also use great quantities of coal in transporting arms and fighting men. To move a single 20-car troop train from New York to San Francisco, for instance, takes all the coal one of you can mine in eleven weeks.

It is easy to see that your job in this war is all-important. Unless it is done swiftly and well, our munitions plants and our fighting forces cannot function.

### Encouragement

*No one will question the determination of the average miner to do his bit in achieving victory. Neither will anyone question the fact that anyone, operator as well as miner, will work more enthusiastically when he knows exactly how his efforts will help the job along. So promoting a better understanding of the task and the individual's part in it, of which the step described above is an example, well merits the attention of the industry.*

### Draft Deferment Guide Issued to Local Boards

Occupational Bulletin No. 4 has been issued to local Selective Service Boards in all states for their guidance in deferring essential employees in anthracite and bituminous mining. The bulletin was first issued May 2 but was withdrawn for revisions and later reissue. It contains a list of critical occupations in the two industries, and the principal changes made were in the length of experience or training necessary for classification as an essential man. This period was reduced in many instances.

## Implementing Safety in War Debated by Inspectors

**Federal Inspection Welcomed as an Aid to Safety, but Conflicts Deplored—Safe Cables, Fighting Mine Fires, Duties of Inspection Forces and Priorities Also Discussed at Lexington Meeting, May 25-27.**

WELCOMING the new federal mine inspectors as a further element in the promotion of safety, so much needed in the hurly-burly of the present war effort, with its transfer of some of the best brains of the industry to the armed forces and to Washington and with the filling of their posts by understudies, often of less competence, also with the introduction of untrained men and the use of substitute materials, the members of the Mine Inspectors' Institute of America, meeting at Lexington, Ky., May 25-27, reviewed the entire armory of safety for use in their campaign to lower accident rates and thus boost production.

### Rubber Cut Affects Cable Safety

That the rubber-rationing board has cut the percentage of rubber in cable coverings from 40 to 35 percent and from 60 to 50 percent was announced by G. F. Newman, associate coal-mine inspector, U. S. Bureau of Mines (see p. 62), who added that 15 percent of such rubber must be obtained by reclamation. He hoped that in view of the severity of the use to which cables in the mines are exposed, the rationing board soon will see fit to restore the safety standard of former years. Cables too small to carry the needed energy, fuses of excessive capacity, bad splices, cables strewn on abrasive rocks and equipment, imperfect electrical returns, the heating of cables by coiling or reeling were some of the sources of hazard to which he called attention.

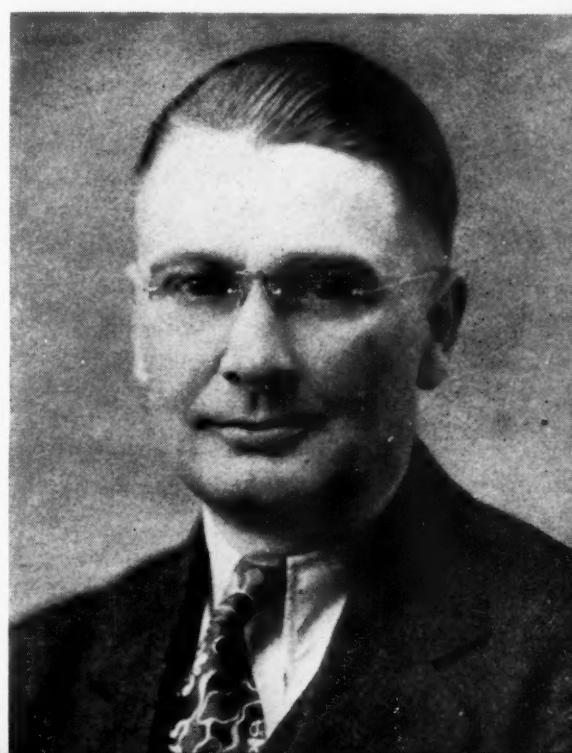
**Fire on a Return-Air Motor Road**—Operation of a locomotive in return air from a mine, even when so diluted with purer air as to make it non-explosive and nontoxic and even though the purpose of the trip was to take men and supplies for the extinguishment of mine fire by

water, were condemned by Thomas G. Reese, deputy mine inspector, Division of Mines, Salem, Ohio. The fire occurred Dec. 1, 1941, in the Powhatan mine, Powhatan Mining Co., Powhatan Point, Ohio. Tests with methane and carbon-monoxide detectors had been made to ascertain whether the air, thus diluted, was safe for travel, but, in the opinion of Mr. Reese, indicators could give only misleading assurances, as the motor trip might be derailed, electric current might fail, the fan might stop and other conditions might change, putting all the men on the trip in jeopardy.

Five headings, two intakes and three returns, extend the full 4,000 ft. from fan shaft to bleeder headings of B North Junction, and, by a reversal of the air current, the risk of passing through the return current for that distance would have been avoided, said Mr. Reese. The motor-road return had stoppings on

(Turn to page 99)

N. P. Rhinehart, new president, Mine Inspectors' Institute of America



## Coal Industry Takes Lead In Scrap Salvage

Metal scrap collections by coal mines for the two weeks ending June 9, as reported to the Industrial Salvage Section of the War Production Board, exceeded those of the preceding two-week period, with an aggregate of a little over 37,000,000 lb., consisting of 36,408,414 lb. of iron and steel; 288,019 lb. of copper; and 439,017 lb. of other metals. Total metal scrap collections from coal mines since the inception of the present drive have reached about 124,000,000 lb.

Commenting on the progress of scrap collection at coal mines, John D. Battle, executive secretary of the

National Coal Association, stated on May 30: "The coal industry is leading the parade with respect to the collection and turn-in of metal scrap. Large tonnages of such materials are coming out of the coal mines to be converted to the war effort so that planes, guns, ships and ammunition will reach our fighting forces on the world-wide battle front."

### Fill the Bandwagon

*Every company should get behind this drive. Much metal now gathering rust and cluttering up holes and corners can be salvaged, with two-way gain—cleaner mining plants and greater pressure on the enemies of liberty.*

## Miners Quarrel With the CIO Grows; Organization Changes Approved

**Murray Out as Vice President—Succeeded by O'Leary—UMW Presses for Payment of \$1,665,000 From CIO—Splitting District 17 Sanctioned—Return of Fines and End of Alleged Contract Violations Urged.**

THE GROWING estrangement between the United Mine Workers and the Congress of Industrial Organizations resulted in the separation of Philip Murray from the UMW official roster early in June. His post as vice president was declared vacant at a special meeting of the union executive board and policy committee in Washington, D. C., on the ground of his accepting the presidency of the steel workers' union and drawing his pay from that organization. John O'Leary, international board member, District 5, was confirmed as the new vice president.

Other shifts in the official roster included the resignation of Van A. Bittner as president of District 17 and the appointment of Percy Tettlow, its former head, as provisional president. Martin Wagner, international board member, District 50 (gas, coke and chemical workers), also resigned to be replaced by Charles H. Fell.

Voting of the office of vice presi-

dent vacant was followed by adoption of a resolution charging Murray with "fathering, promulgating and causing to be published false, malicious and defamatory matter" slandering President Lewis and the UMW. Other resolutions condemned the attitude and actions of the CIO against the UMW as represented by its employees, agents and representatives. Such actions were declared to be deliberate sabotage of union principles. Winding up its measures against the CIO, the executive board and policy committee voted to withhold cash payment of the UMW per capita tax until the CIO acknowledged the validity of loans totalling \$1,665,000 from the UMW. Meantime, the per capita tax is to be tendered in the form of drafts against the amount asserted to be due from the CIO.

Other action at the Washington meeting included a vote to split up District 17, thus restoring the old boundaries of District 29, taking in all smokeless coal production except

from the Upper Buchanan field of Virginia. A proposal that the annual vacation be foregone also was approved with the proviso that a token payment of \$20 be made by the operators.

In addition to making the vacation agreement, the UMW and the representatives of the Appalachian Joint Wage Conference agreed on the outline of a plan to increase coal production. Joint district and local committees were envisioned to foster patriotism, promote production and stress to miners and operators the necessity for continuous work and elimination of all avoidable absenteeism. The preliminary organizations also were expected to grow into a national conference of coal operators and miners to organize a national committee on production.

Return of fine money allegedly illegally collected and the splitting up of District 17, referred to previously, also have been coupled with an investigation of alleged violations, according to the United Mine Workers, of a clause in the Southern Wage Agreement eliminating the practice of docking for rejects. On June 2, a special UMW commission, authorized by the union March 11, submitted a report stating that such violations were taking place, recommending the splitting of the district, urging that the steps be taken to secure repayment of the fines and recommending that a better system of handling grievances be set up.

A 16-day work stoppage in the deep mines of Indiana growing out of a disagreement over wage rates for shotfirers and drillers was certified to the War Labor Board June 10 at the request of Governor Shricker.

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## Lake Erie Coal Dumpings Set Early-Season Record

Bituminous coal dumped into ships in May at Lake Erie ports totaled 6,251,029 net tons—6,035,823 cargo and 215,206 fuel—and the aggregate for the season to June 1 was 12,957,182 tons, highest on record for the date. The all-time record for a single month was made last October, when 8,100,000 tons was dumped.

# Combustion and Utilization Surveyed at Battelle

**New Smokeless Heaters, Coke-Tree-Free Stokers and Powdered-Coal Furnaces for Steel Treatment Shown Coal Men at Bituminous Research Conference.**

EQUIPMENT that will enable bituminous coal to meet more closely the needs of comfort heating, metallurgical work, locomotives and power generation is foreseen by the fuel engineers who addressed 140 representatives of the bituminous coal industry in an all-day conference and exhibit sponsored by Bituminous Coal Research, Inc., and held May 28 at Battelle Memorial Institute, Columbus, Ohio. This research group is conducting a \$200,000 program in the fuel laboratories of the institute.

## First View of Research Results

Opening the conference, Howard N. Eavenson, president, B.C.R., declared: "This is our first presentation to our subscribers of the developments in equipment and technical information resulting from the research work which was begun in November, 1940, with their contributions." He declared that the new stoves would burn smokelessly and would accomplish the end results desired by the smoke ordinances of cities, many of which now try to abate smoke by specifying an upper limit on volatile matter in coal. Battelle, having more faith than the industry in the results obtained from research, started the work on its own funds and is now being repaid. Problems in the operation of the mines, as well as in combustion, need consideration.

"To the best of my knowledge, today's gathering of coal executives is the largest ever assembled for the sole purpose of discussing research," commented Clyde E. Williams, director, B.M.I., who added that modern industry depends increasingly on research. "We will always have our woodshed inventors, but they will require the modern research organization if they are to bring their ideas to fruition during

their lifetime." Use of part of the small return from Battelle's endowments has induced the coal industry to begin a three-year program of research. The chemical industry, which spends 2 to 4 percent of its gross sales, is an example of the confidence animating those who once get a taste of the many advantages derivable from a research program.

"We have only begun to tap the many possibilities for increasing and improving the use of coal. Old concepts about coal's limitations are becoming obsolete, and new uses develop in proportion to the effort expended on research," asserted J. E. Tobey, chairman, B.C.R. Technical Advisory Board. First of all, the industry asked with bewilderment, "What are we going to get out of it?" and then tried hard to believe in it. Now that it is started and success has been attained, "we have begun to go places." Research has made it possible to use coals with a wide range of specifications—not solely the particular coal that hitherto had been believed indispensable for that specific application.

Work has been done on the humble heating stove, for, after all, 40 percent of the homes are heated by that device. Studies are being made into the design of large stoves and on those of medium size, but work will be done on stoves of smaller size also. Small industrial furnaces will be studied as well as larger units. Studies are being made into the metallurgical uses of coal. Pulverized coal heats steel satisfactorily and with a minimum of scaling.

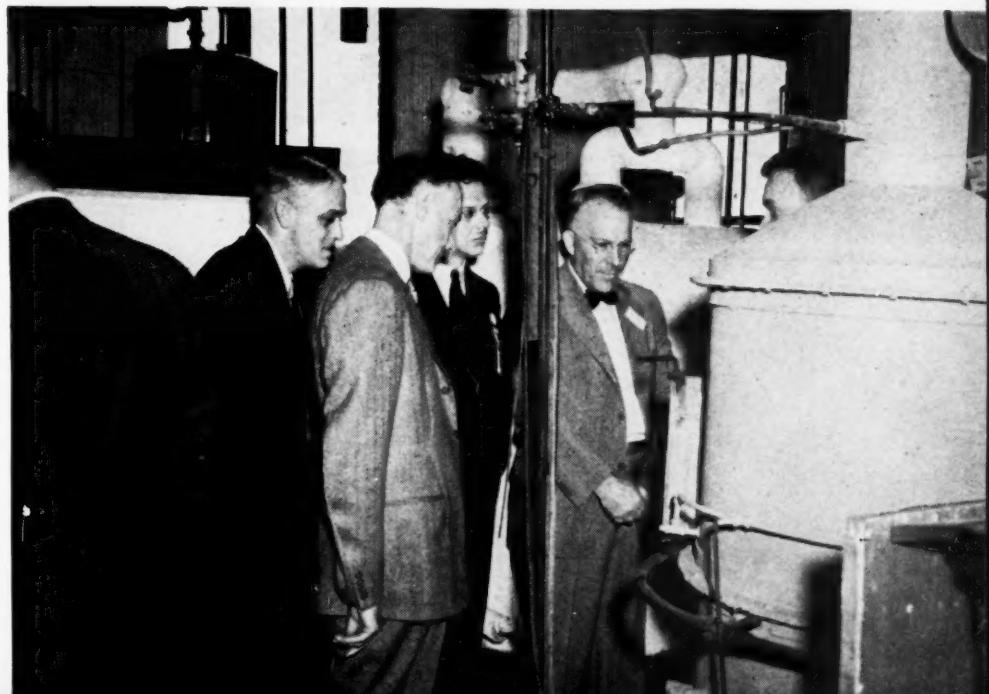
Too much has been said as to the insignificant quantity of coal that can be used for chemical purposes. Rubber manufacture will afford an outlet for thousands of tons of coal. During the war, industry must not ease up on quality or dustproofing, for the householder will go back to oil and gas unless both standards are maintained.

## Spray-Oil Substitutes Sought

In anticipation of the recent limitation order prohibiting the use of petroleum products for treating coal, "Battelle," stated George W. Land, fuel engineer for that organization, "has for some time been investigating the use of other material for allaying dust." Because calcium chloride alone or in combination with other materials will keep the surface of coal moist, it has been widely used for dustproofing coal, but data on quantities and resultant effects have been meager. An investigation of the corrosive

(Turn to page\*107)

Battelle stoker fuel bed intrigues coal men.



# Coal Problems Spotlighted At Rocky Mountain Meet

**Rock Tunneling With Shaker—Mining With Track Units—  
Inspection and Accident Prevention—Energy Sources  
and Marketing Problems—Surface Moisture and Slack  
Characteristics—Belt-Slope Haulage and Mine-Car  
Transportation—Improving Power Use at Coal Mines,  
as Analyzed at the 40th Regular Meeting.**

OPERATION, safety, power and coal characteristics and utilization were the major themes of the 40th regular meeting of the Rocky Mountain Coal Mining Institute, held at the Hotel Utah, Salt Lake City, Utah, June 10-12. Papers and discussions took in federal and State coal-mine inspection, accidents in Utah, rock tunneling with shaker equipment, mining with track-mounted machines, belt-conveyor haulage, locomotive and mine-car transportation, Utah coal production under wartime conditions, size consist and surface moisture of certain western coals, energy sources in western states, efficient use of power in coal mines, arc welding and aluminum production.

General chairman for the meeting was Carl W. Sinclair. Committee heads were: ladies, Mrs. B. P. Man-

ley; program, Claude P. Heiner; banquet and entertainment, Leonard E. Adams; finance, Joseph Parmley. Technical sessions were presided over by Paul L. Shields, vice president, United States Fuel Co.; Vern O. Murray, general superintendent, Union Pacific Coal Co.; W. D. Bryson, manager of mines, Utah Fuel Co.; and Burt B. Brewster, publisher, *The Mining and Contracting Review*.

Gomer Reese, of Colorado, headed the list of new officers chosen at the business meeting. Resolutions again pledged the institute's "full and unequivocal support to this country in war as well as in peace, reserving, as always, the right to make constructive criticism based on our knowledge of the condition and needs of the industry," backed more funds for the U. S. Bureau of Mines testing station at Golden, Colo., and commended federal mine inspection for its cooperative attitude and sincere desire to assist in promoting safety. John McG. King, who retired June 1 from active duty with the John A. Roebling's Sons Co., was made an honorary life member.

## Federals Examine 200 Mines

Approximately 200 mines had been examined up to May 1, 1942, declared E. H. Denny, supervising engineer, U. S. Bureau of Mines, and G. O. Arnold, senior coal-mine inspector, Salt Lake City, in discussing the federal inspection and explosives control acts. Inspections and reports are based largely upon "Tentative Coal Mine Inspection Standards," published by the Bureau of Mines in February as Information Circular 7204. "As indicated by the word 'tentative,' they

are subject to modification, deletion and addition as experience and changes in mining methods justify."

Thorough and complete examinations are the endeavor of the inspection service. Roughly, two such inspections and complete reports can be completed by each inspector in a month. In initial inspections, two or three inspectors have worked on a single operation to promote familiarity with the work and uniformity in methods. "For the first year, inspections will be confined largely to mines employing more than 25 men because of the greater number of men exposed in such mines to possible catastrophe hazard. Nevertheless, some small mines are being inspected. . . .

## Numerous Hazards Corrected

"In several mines, both East and West, hazards that threatened an immediate catastrophe have been found and corrective measures taken through action by management or State inspectors or both. Such immediate hazards have not been the presence of explosive gas and deficient ventilation only but have included underground water and extensive roof dangers. As might be expected, numerous hazards to individuals connected with unsupported and dangerous roof, haulage, electricity and explosives have been found. Also, instances have been found where the miners as well as the operator were reluctant to change practices to conform with safer ones prevalent in other mines or fields," due to cost.

Approximately 50 explosives investigators have been appointed under the Explosives Control Act of Dec. 26, 1941, to check on the issuance of licenses, and the storage, handling and theft of explosives. In the case of coal mines, however, much of the U. S. Bureau of Mines' work in connection with storage and explosives accidents will be done by employees of the Safety and Coal-Mine-Inspection divisions rather than the new investigators.

"Several responsibilities rest upon the management of operations using explosives under this act. These ordinarily include the following:

(Turn to page 76)

Gomer Reese, of Colorado, new  
R.M.C.M.I. president.



# EFFICIENCY RAISED 80%

## By Experience Plus Main-Line Belt At Latest Hart Mine in Western Kentucky

**E**IGHTY PERCENT more tons per man-hour underground is the improvement made through profiting from years of experience plus substituting a belt in place of main-line track haulage at a new operation of the Hart Coal Corporation near Morton's Gap, in western Kentucky. This new No. 7 mine, opened in 1940, is being worked with rubber-tired tractor-trailer equipment behind loading machines, employing the Fletcher semi-longwall mining system adopted in 1936 and used to work out the company's acreage at Moss Hill (*Coal Age*, January, 1938, p. 47). Cutting machines which operated from 250-volt d.c. power at Moss Hill were fitted with new 220-volt a.c. motors for the new mine.

The Hart Coal Corporation is headed by Brent Hart, whose experience with mechanical loading goes

back to 1923, in which year he made an investigation which resulted in the purchase of two Joy 4BU loaders. William A. Vinson, general superintendent, and William O'Bryant, mine foreman, have been with the company for many years.

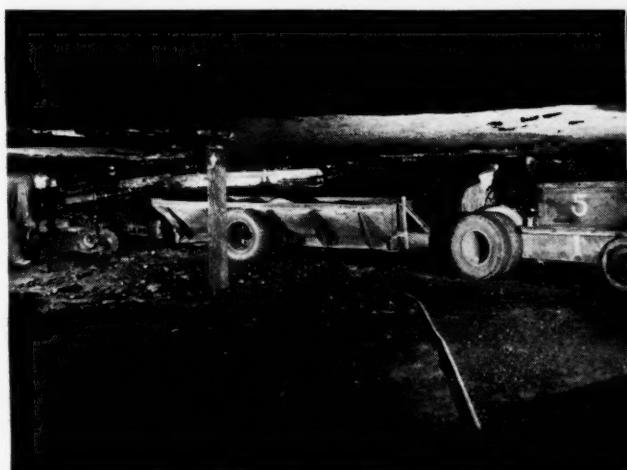
Principal equipment at the new mine includes six Goodman 12AA shortwalls, five Dooley Bros. post-mounted drills, six Joy loaders (three 8BU and three 14BU), sixteen Baker-Raulang tractors with a corresponding number of 4-ton drop-bottom semi-trailers and a 4,000-ft. (c.c.) Barber-Greene 30-in. belt conveyor which extends from a transfer pit to the tipple. This pit is the sixth installation in the mine. Coal breaking is done with 2-in. Cardox shells loaded with 3 lb. of carbon dioxide.

Mining is in the No. 9 seam, which here lies practically level. Thickness

is 58 in.; continuous partings are absent. Cover averages 120 ft. and top conditions generally are favorable. The immediate top is 3 to 4 ft. of firm black slate and the bottom is a hard shaly fireclay. The present tract includes 2,400 acres of minable coal. To transport the product from No. 7 mine to the company's tipple at White City, served by the Louisville & Nashville and Illinois Central railroads, it was necessary to build 4.6 miles of railroad, which the coal company now operates.

Haulage equipment consists of two standard-gage rod locomotives, one 90-ton and the other 56-ton. The mine works two shifts and the tipple one shift. Coal mined on the second shift (some 1,500 tons) is stored in railroad cars awaiting the start of the tipple shift.

In contrast to the earlier practice



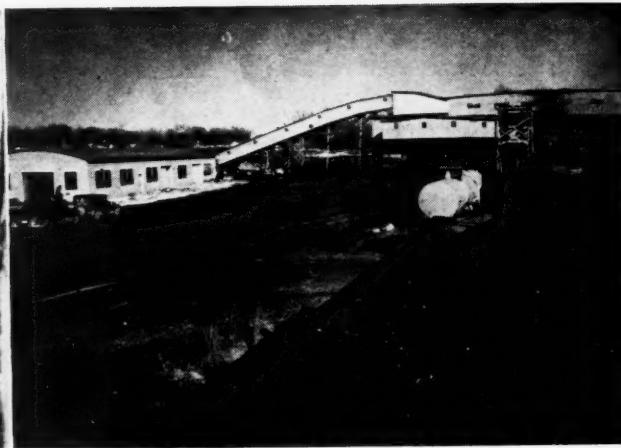
Sixteen battery-powered tractors with drop-bottom semi-trailers haul from four loading machines.



Face preparation in full swing. The man in the center is bringing up a carbon-dioxide tube.



Looking inby on the main entry where the end of the belt starts down into Pit No. 6, the present dumping point for all 16 semi-trailers.



This White City tipple, 4.6 miles from No. 7 mine, screens, prepares and loads in one shift 3,000 tons of coal from two mining shifts.

of having semi-trailers dump into a hopper from which the coal was moved by a feeder and belt elevator to mine cars, semi-trailers in the new No. 7 mine dump directly onto the main entry belt. The inby end of this belt is placed in a pit 11 ft. lower than the normal elevation, reached at the top of an incline 20 ft. long. All belt idlers are Timken-equipped.

The belt is in the center heading of a five-heading entry. In opening the mine the first 535 ft. of this entry was loaded out with the Joys serviced with mine cars pulled by mules. The track then was taken up and the first section of the belt installed. Now, the mine is entirely without track.

Rooms are driven 27 ft. wide on 40-ft. centers and 400 ft. deep. Crosscuts are made 16 ft. wide on 36-ft. centers (Fig. 1) and rapid widening of each crosscut is begun with the second cut. The third cut meets another third cut from the adjacent crosscut. The apex of the V thus formed becomes a point on the rib

line of the next room. In a 27-ft. room the coal is broken down with three Cardox shells loaded in holes drilled close to the roof.

The underground crew on a day shift totals 75 men, including the mine foreman and one entry boss, and on a night shift 74 men, including an entry boss. The production average per operating shift is 1,250 to 1,500 tons of coal.

Cincinnati chains and "Duplex" throw-away bits are used on the six cutting machines. On the old tractors some of the original "Exide-Ironclad" 300-amp.-hr. batteries are still in use. Each is made up of 24 cells of 19 plates each. Sixteen batteries are on charge while the other 16 are in duty on the tractors. Three Electric Products Co. motor-generator sets furnish the charging current.

Original drop-bottom semi-trailers are being replaced with new units built in the mine shop. Bodies are 1 ft. wider and 1½ ft. longer, making the dimensions 7 ft. 3 in. x 12 ft. In-

stead of stub axles the new semi-trailers have one axle, made from 3x3-in. stock and continuous through the body of the car. The back end of the body, over which the loading-machine boom must operate, is made 22 in. high compared to 30 in. on the originals, thus making it possible to load larger lumps.

#### Power Borehole Drilled

Power at 2,300 volts is taken into the mine through a drillhole and distributed to five underground transformer substations which supply the 220-volt power. One has three 50-kva. transformers and each of the four others has three 25-kva. units. Maximum distance of transmission of the 220-volt power is 500 ft. including 300 ft. of U. S. Rubber trailing cable on the cutting machine.

No picking is done in the small tipple at the mine portal. Instead, cleaning is done in the screening plant and tipple at White City on the common carrier railroad. The mine-portal tipple does include, however, a loading boom to minimize breakage at that point of handling. Seventeen men comprise the crew which handles railroad-car dumping, preparation and final loading at the tipple. As mentioned previously, this tipple works but one shift and the tonnage loaded ranges from 2,500 to 3,000.

Maintenance is accorded an important place in the operation. The central shop is near the White City tipple in a new concrete-block building with steel roof structure—floor dimensions 75x100 ft. This is partitioned across one end to form a warehouse. In turn, a corner of that is partitioned to form an office for the superintendent.

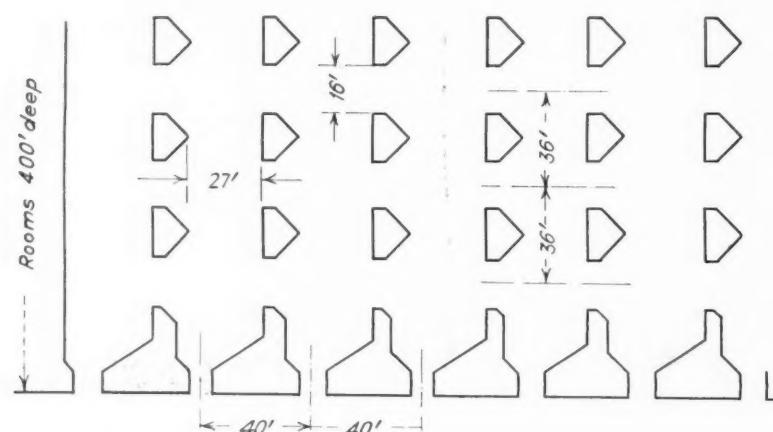


Fig. 1—Room-working plan at the new Hart No. 7 mine.



The new Piney Fork plant showing loaded mine cars feeding into the dump house. Washed-coal screening is done in the original tipple on lower ground at the left.

## WASHERS FOR 7X0

Plus Heat and Mechanical Drying

### Top Mine-Run Blending at New Hanna Plant

**B**LENDING coal from various sections of the mine by a car transfer at the rotary dump, washing all coal from 7 in. down, drying 1 $\frac{1}{4}$ x0 (in three sizes) by thermal-screen and centrifugal methods, return of dryer effluents to the closed jig-washing circuit and operation one shift out of three on foreign coal are among the outstanding features of the new preparation plant serving the Piney Fork No. 1 mine of the Hanna Coal Co., in Jefferson County, Ohio. Shipments from the plant now average 3,500 tons of cleaned coal per day of three shifts. Drying was the principal concern in the design of the plant, and the methods and equipment, in the opinion of James Hyslop, general manager, are proving better than expectations.

Piney Fork No. 1, an old operation and one of three large Hanna operations in the Pittsburgh No. 8 seam of eastern Ohio, was the last to be equipped with mechanical-loading equipment and with its complement, a modern preparation plant. Experience at other mines was incorporated in the plant design. Air cleaning of fines

Pioneering in 1929 a 100-percent mobile-loader operation in the Pittsburgh No. 8 seam of eastern Ohio, the Hanna Coal Co. installed its first washing plant at Fairpoint No. 9 mine in 1930. This plant served as the laboratory for later plants at Willow Grove and Dun Glen, followed late last year by Piney Fork No. 1, the subject of this article. Reflecting accumulated experience, Piney Fork incorporates advanced ideas for washing large sizes, screening and mechanical drying of the smaller grades, and blending of mine-run.

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By J. H. EDWARDS  
Associate Editor, Coal Age

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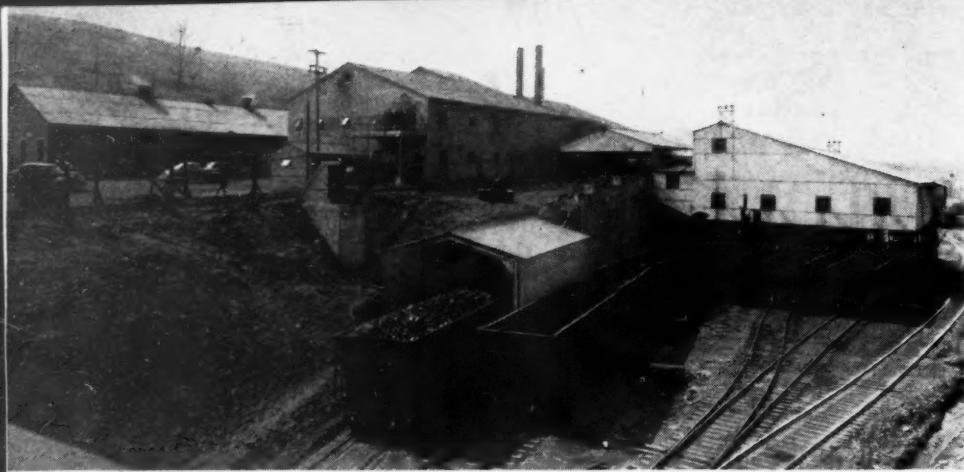
was ruled out early by the management because much of the coal arrives in a wet condition, and also because

there is a high concentration of impurities in the minus  $\frac{1}{8}$ -in. fraction. Steam coal and domestic sizes, including some domestic stoker, constitute the principal products.

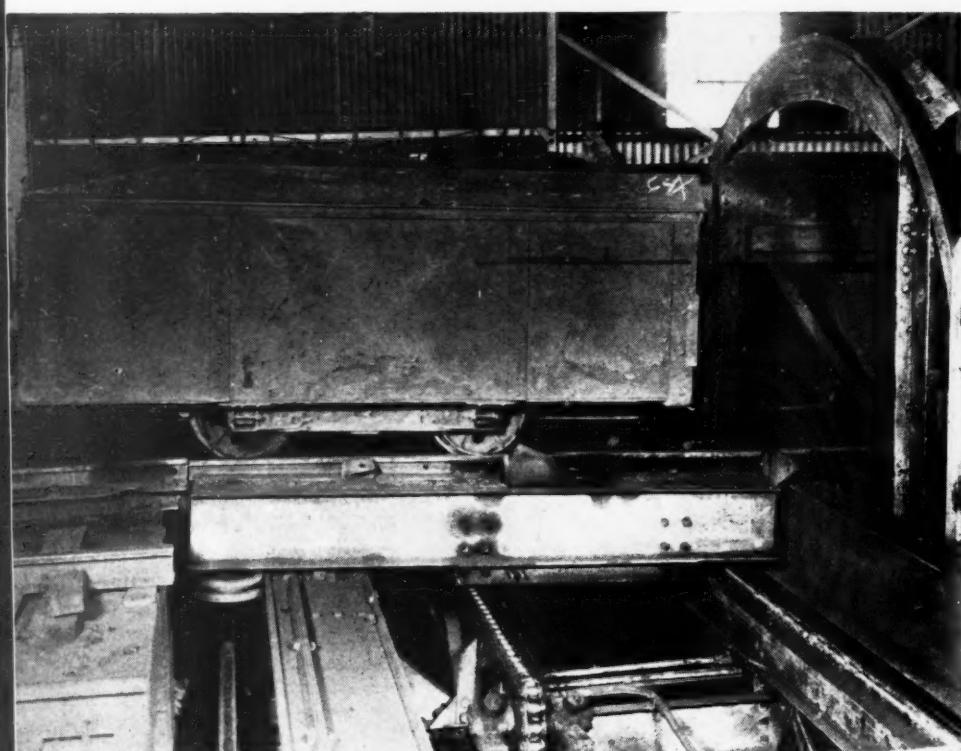
The mine, a combination drift and strip operation working now two shifts six days per week under the management of R. L. Wilhelm, general superintendent, and James Reilley, mine superintendent, was equipped in 1935 with a modern Jeffrey steel tipple now utilized with a few changes for sizing and loading the output of the new Link-Belt washing and drying plant which went into service in August, 1941.

Impurities removed in washing consist principally of about 2 in. of high-ash top bone and a 3 $\frac{1}{2}$ -in. laminated band from near the center of the 4 $\frac{1}{2}$ -to 6-ft. seam. At times draw slate comes down in large hard slabs and up to 12 in. thick and also must be eliminated in the plant. Total reject averages about 28 percent of the mine-run material by weight.

Blending coal from the various sections of the mine for maintaining uni-

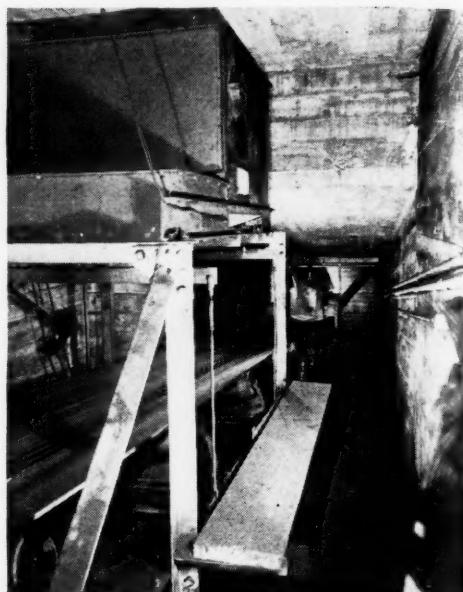
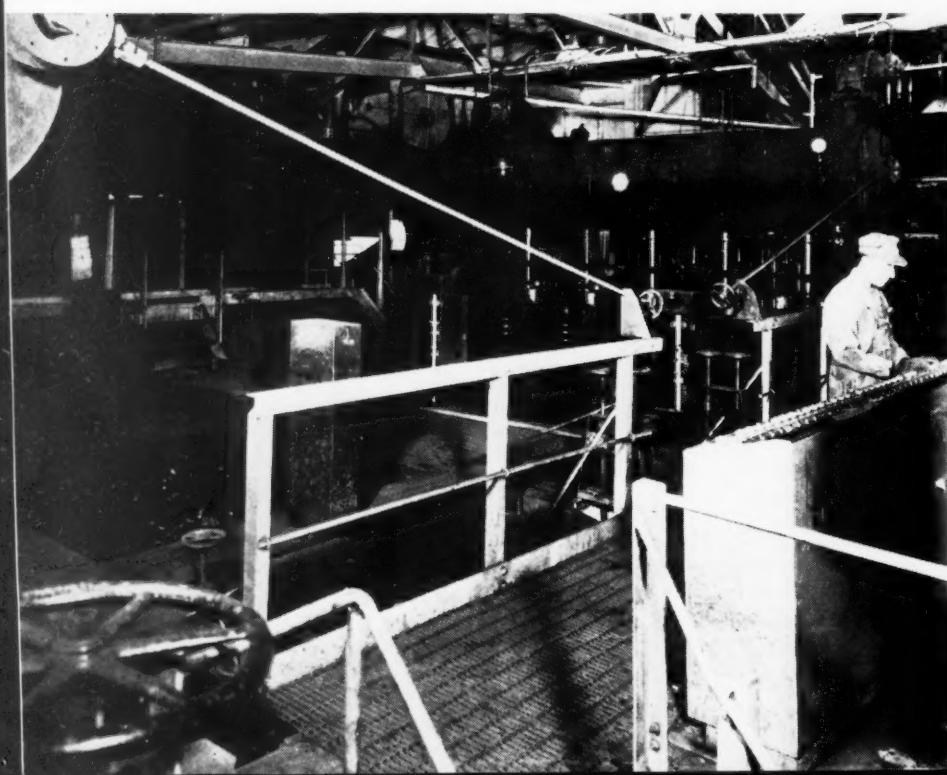


Foreign coal, washed on the owl shift, is dumped in the building in the foreground and goes through a tunnel to the scalping screen and picking table. Upper left is the mine shop and preparation-plant office.

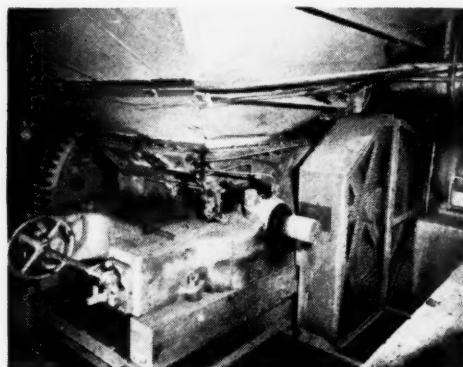


This loaded car has been transferred by a table from No. 2 to No. 1 dump track ready for dumping and blending with coal from Track No. 1.

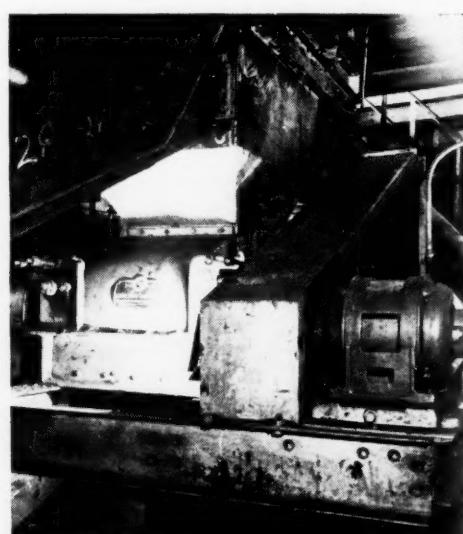
Piney Fork washing units. Right is the bench board for washing and drying plant controls.



Foreign coal is weighed on this recording scale on the 42-in. belt.



Mine rock up to 36 in., with rock from the table at the scalping screen, is reduced to minus 6-in. by this 21x42 crusher.



Spring-relief double-roll sizer reducing 7x11/4-in. washer middlings to minus 1 1/4-in. for rewashing. Another similar sizer does the same job on table pickings.

lormity of product was solved by providing two loaded tracks to one Link-Belt rotary dump. At present, cars are uncoupled and dumped one at a time. The No. 1 load track lines up with the dump but first passes over a transfer table with two parallel tracks. By this table, the cars from track No. 2 are shifted one at a time to the dump and put through along with the cars from No. 1 track to effect any desired proportioning.

The new mine-run handling equipment includes a 30-ton underground dump hopper for railroad cars and from it a 42-in. x 14-ft. reciprocating two-way feeder and a 450-t.p.h. 42-in. x 60-ft. flight elevating conveyor delivering to a belt. The latter conveyor, 42 in. wide and 170 ft. long (c.c.), is on a 6-deg. pitch and includes a Merrick Model E "Weightometer." The plant operates one 7-hour shift beginning at 11:30 p.m. on coal shipped in by railroad from a neighboring mine, also in the Pittsburgh No. 8 seam. Output of clean coal from this shift averages 1,200 tons.

Run-of-mine from either the rotary dump or the foreign coal hopper gets its first treatment in the new plant on

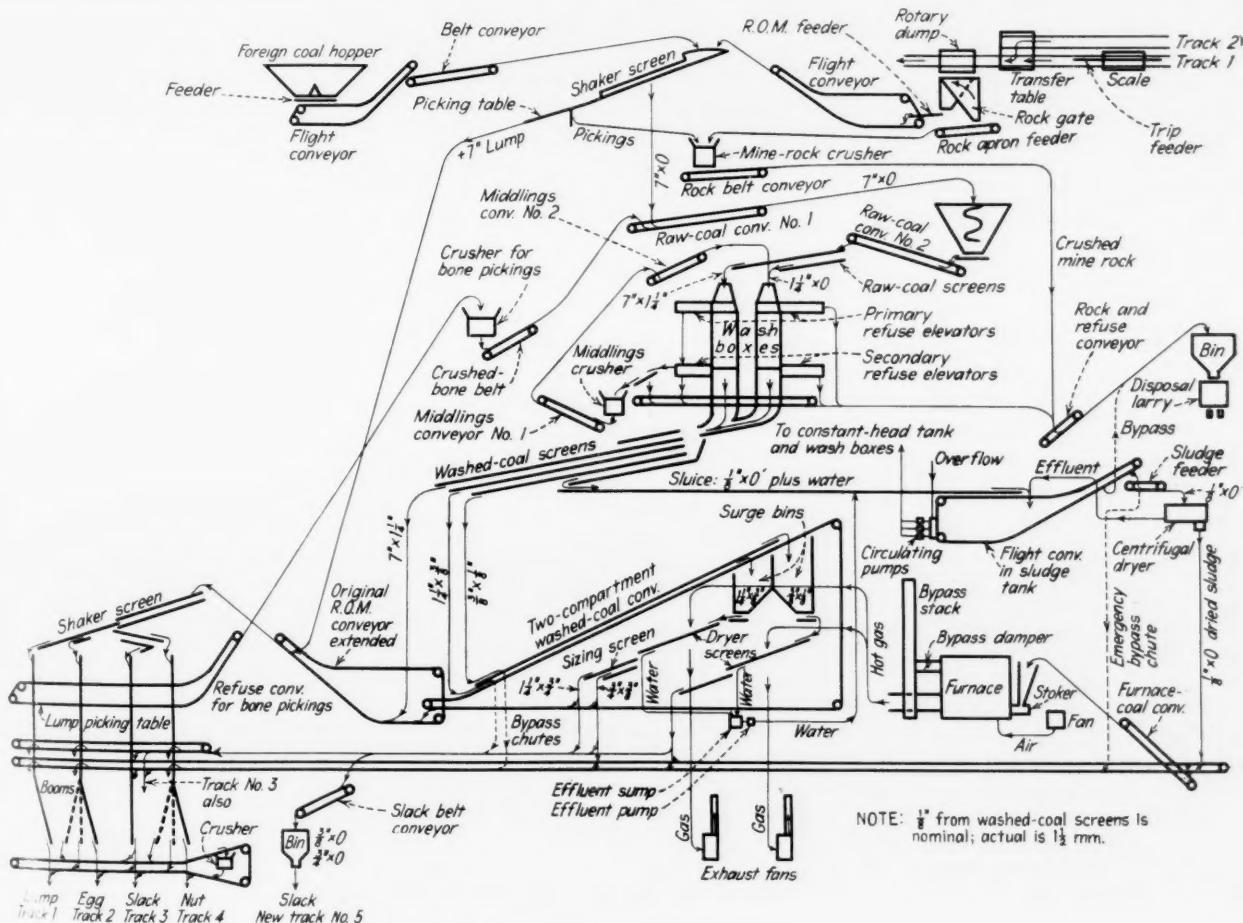
a combination flexible-hanger-type shaker scalping screen and picking table, where the plus-7-in. lump is hand-picked. Together with the washed minus-7-in. it then is conveyed to the shaker screen in the original tipple. The 7x0-in. coal from the scalping screen is carried by No. 1 raw-coal flight conveyor (see flowsheet) to a 6,200-cu.ft. surge bin containing a spiral lowering chute. From here, by a two-compartment raw-coal flight conveyor (42x12-in. by 31½-ft. c.c.), the flow is to a pair of flexible-hanger raw-coal screens.

The two sizes (7x1¼- and 1½x0-in.) made on the raw-coal screens are sluiced separately into Model 5044 Link-Belt air-pulsated jigs, each with a capacity of 175 t.p.h. The rate at which this raw coal is delivered is controlled through a Link-Belt "P.I.V." variable-speed gear between the motor and the feeder under the surge bin mentioned in the preceding paragraph. Adjustment of the transmission ratio is remotely controlled from the operator's station on the jig floor.

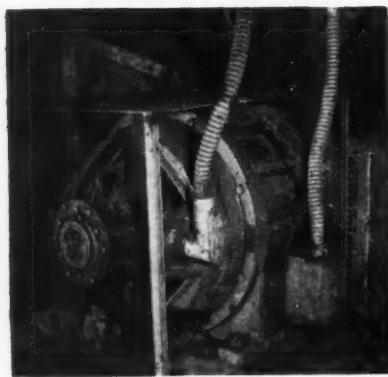
Washing the 7x1¼-in. is a relatively simple job. This jig is operated with only a thin bed of refuse—that is,

without one of fixed depth—and the entire control is manual. Not so simple is the operation of the fine-coal jig. Efficiency in this washing, which is done with a fixed depth of refuse float-controlled, is highly dependent on an even rate of feed. At first the operator had no definite way of knowing the speed of the feeder, but this was solved by adding to it an ordinary limit switch and connecting it to a light at the operator's station. Each double stroke of the feeder flicks out the light. By counting the flicks the operator can determine the speed.

Washed coals from the two boxes mix in a Y-sludge on the way to the dewatering screens. After several weeks' operation it was suggested that the dewatering screens would benefit if some of the water could be drawn off the 7x1¼-in. between the wash box and screens. Accordingly a short section of screen plate with 3/8-in. holes was installed in the sluice from the jig, with a water-tight box beneath it fitted with a drain pipe to the suction of the wash-box circulating pumps. A butterfly valve in this pipe allows the operator to drain off all but just enough water to sluice the coal to the



Flowsheet, Piney Fork preparation plant.



Like all other new motors in the plant, this 60-hp, 685-r.p.m. wound-rotor unit, driving rock crusher through V-belts, has ball bearings.

dewatering screen. Consequently, the screens do a better job.

These screens, otherwise known as the washed-coal classifying screens, are the flexible-hanger type, 7 ft. wide. Top and bottom decks of the upper screen are 32 and 15 ft. long, respectively. Corresponding lengths on the lower screen are 18 and 33 ft. Three sizes are made, two of which go on to additional drying equipment. Water carrying minus 1½-mm. coal is sluiced to the sludge tank. The 1½x3½-in. and ¾-in.x1½-mm. sizes are dried separately in two Link-Belt screen-type heat dryers of the general type now designated as Link-Belt "SS."

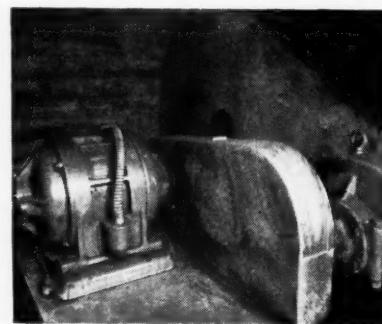
The two sizes in question are conveyed to two 19-ton bins by a two-compartment 30x8-in. flight conveyor with 76-ft. horizontal run and 22-deg. elevating run. From the bins they are moved out by reciprocating feeders with "P.I.V." variable drives to separate heat drying screens, also on flexible hangers. Each screen has two decks, the uppers being 6x26½ ft. and the lowers 5x16½ ft. The unit drying the 1½x3½-in. fraction also separates the product into 1½x3¾-in. and ¾x3½-in. sizes. It is equipped with stainless plate with 5/16-in. round holes.

The fine-coal dryer, handling ¾-in.x1½-mm., is fitted with Bixby-Zimmer stainless screens (1½-mm. openings with the wires running lengthwise). This decking, which works successfully without blinding, was arrived at only after several experiments beginning with 1/8-in. stainless wires with 1½-mm. openings. Serious blinding with the first cloth limited surface moisture removal to about 4 percent, whereas with the present decking the ¾-in.x1½-mm. surface moisture is reduced from 12 to 1 percent. Comparative perform-

ance of the 1½x3½-in. dryer is: surface moisture of feed, 7 percent; of the dried output, 1½ percent. The coal is exposed to the heat 12 seconds. Table I gives performance data for both the heat dryers.

To cool the fine coal during extremely hot weather, plans are under way to lengthen this dryer 3 ft. In the added section, cool air will be pulled through the moving coal bed. Each dryer is accompanied by a Type IE Size 41 Clarge fan with stainless-steel wheel driven by a 50-hp. motor through V-belts. The heat-dryer design minimizes steel use and defeats corrosion. Because most of the new plant is on filled ground higher in elevation than the tipple it was found practicable to place the dryers on ground foundations and use concrete for the wind boxes and the entire under portion, including the effluent collecting basin.

From the sludge tank, also concrete



"Valve-amp-rotor" motor (40 hp., 1,750 r.p.m.) driving foreign-coal flight conveyor through chains and inclosed 573:74.73-r.p.m. reducer.

and on the ground, a flight conveyor 5 ft. wide and 111 ft. long (horizontal centers) delivers the sludge to a 15-in.x12-ft. bar flight feeder ahead of the centrifugal dryer. The latter is a 48-in. C-M-I continuous unit, which reduces the surface moisture of the minus 1½-mm. coal to 5 percent when the dryer screens are in good condition. As they wear, the output surface moisture goes up and when it reaches 7 percent the screens are renewed.

Screen life (1/8-in. steel plate, 1/8-in. round holes) now is 80 hours or better, compared to 37 hours with the thinner plates with 1/4-in. holes first tried. Also the drying is consistently better. Ordinarily the basket screens are renewed on a week-end or between shifts. When, at times, it becomes necessary to do the job during a shift it can be completed in 30 minutes by

installing a spare basket on which the screens have been renewed. Trouble through the wet coal sticking to a steel chute feeding the dryer was eliminated by replacing the steel plate with a sheet of flexible rubber (see p. 68 of this issue).

Make-up water for the plant is taken from a nearby creek and is used without treatment. The washer system operates in closed circuit including the effluents from the centrifugal and heat dryers. There is no appreciable build-up of fines if the mine-run feed to the plant is confined to underground coal. But for some reason a slight accumulation takes place when washing strip coal and now the plant is bled once a week.

The plant has four crushers, three of which are new. One is a McLanahan & Stone 21x42-in. sledge-wedge single-roll machine rated at 75 tons per hour for crushing to 6-in. the mine rock and also the slate picked from the table at the scalping screen. Another is a Link-Belt 26x24-in. two-roll Type C chain-driven adjustable spring-relief sizer rated 80 tons per hour for reducing 7x1½-in. wash-box middlings to 1½-in. The third is another Link-Belt sizer of the same capacity for reducing lump, egg and nut pickings from the tipple to 1½-in. also for delivery to the fine-coal wash box. A Jeffrey double-roll 30x42-in. already in the existing tipple and served by the mixing conveyor now is used when it is necessary to break down cleaned coal.

Slack track with loading bin was added to the four-track tipple (five loading points) so that now the equivalent of six loading points are available.

Refuse-disposal equipment was simplified by inclusion of the McLanahan & Stone mine-rock crusher which can take 36-in. pieces. By reducing such material to 6-in. it was practicable to

Table I—Average Performances of Screen Type Dryers

	¾-in.x1½-mm.	1½x3½-in.
Tons of feed per hour (incl. moisture) .....	42	80
Tons dried coal output..	37	75
Surface moisture of feed, percent .....	12	7
Surface moisture of output, percent .....	1	1½
Hot-gas temperatures at dryer, deg. F.:		
Input above deck.....	700	530
Exhaust below deck..	140	130
Coal temperatures, deg. F.:		
Input .....	55	55
Output .....	150	105
Vacuum at exhaust fan, inches w. g.....	4½	4½
Vacuum above dryer deck, inches w. g.....	1½	1½
Pressure drop through dryer, inches, w.g....	3	2½

specify in the design of the refuse-handling facilities relatively small feeders, chutes, gates and conveyors. Another possible advantage is less chance of the refuse pile catching fire.

Two conveyors in series move the crushed refuse to a larry loading bin. The first is a 24-in. x 75-ft. c.c. belt conveyor on a 20-deg. slope. Next is a 42x12-in. x 99-ft. c.c. flight conveyor, also on a 20-deg. slope, which, however, carries both the crushed mine rock and the wet refuse from the wash boxes. Final disposal is by an electrically powered three-way dumping Differential larry with a 10-ton body capacity.

Hot gas for the heat-drying screens is supplied by a suspended-arch furnace designed to heat 78,500 c.f.m. of 60-deg. air to 850 deg. F., using a "Firite" stoker complete with Hoffman automatic temperature control equipment. The fuel is minus 1½-mm. coal (5 to 7 percent surface moisture) from the centrifugal dryer. The consumption is 1.2 tons per hour.

#### Control Based on Ash

Preparation at the three mines of the company is supervised by A. C. Dittrick, whose office and laboratory are in St. Clairsville. Operation of the Piney Fork preparation plant is directly under J. W. Whelan, general outside foreman. All control is by ash analysis. However, float and sink tests are made periodically to determine possible changes in the seam.

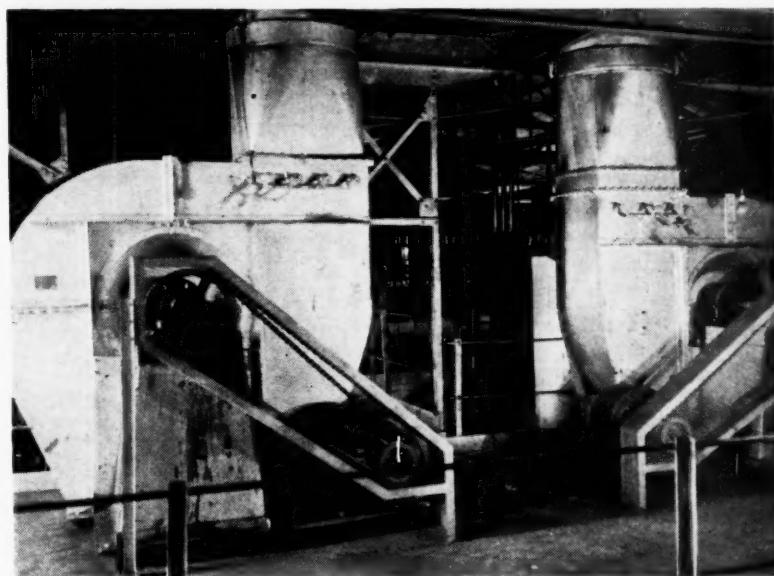
An inspector is on duty each shift to oversee the loading of all sizes into railway cars and to take samples in the plant. Composite samples are taken manually and reduced by riffling for dispatch to the laboratory. The determinations are made without delay so that the day-shift operator gets his results at the beginning of his next shift.

The new plant and existing tipple, as records kept by Bert Simonson, superintendent of machinery for Hanna, show, are operated by 93 motors and the electrical demand is 650 kw. The energy consumption now is 1.8 kw-hr. per ton of cleaned coal, which figure would be somewhat smaller if the plant were brought to full capacity. The new preparation and drying plant has 41 motors totaling 776 connected-horsepower, the largest rated at 60 hp. Drives for the most part are Link-Belt roller chains and Link-Belt inclosed reducers, some of the motorized type. V-belts are used for crushers, screens and other drives where very low speeds are not required.

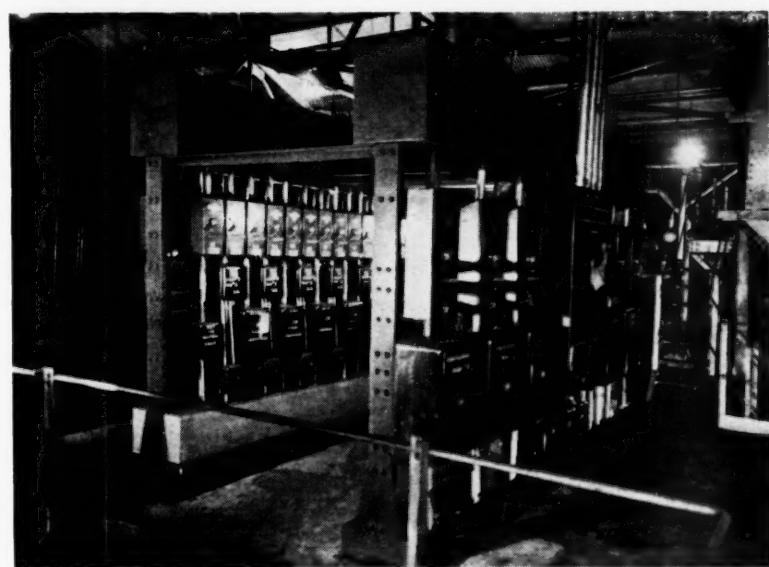
All motors are General Electric with ball bearings. They are wound for 220-440 volts but operated on 440. Open-type units are used with the exception of splashproof motors on circulating and effluent pumps, trip feeder and transfer table. Each motor circuit is controlled by a Trumbull inclosed utility circuit breaker and a General Electric magnetic contactor. The 62 pairs of controls are grouped on two metal frames with inclosed 440-volt bus boxes along the tops on the same floor and close to the wash boxes. Actual control is centered in a bench board carrying pushbuttons and signal lights at the wash-box operator's station.

Power at 440 volts is brought to the bus boxes by three sets of rubber-covered wires in three 3-in. steel conduits. All power and light wiring is in rigid conduit. The 4,000/440-volt transformer substation for the plant is on an outside elevated steel platform with concrete floor attached to the side of the building. This position limits to 80 ft. the length of 440-volt feeder to the panel board. The transformers, single-phase, three in number, are Allis-Chalmers units rated 333 kva. each.

Control of the 4,000-volt primary to the transformers is centered in a Westinghouse metal-inclosed switch-gear unit inside of the building and ad-



Two exhaust fans with stainless-steel wheels pull hot gases through the screen-type dryers.



Motor circuit breakers and magnetic switches are grouped on two racks with inclosed 440-volt buses at the top located on the upper floor near the wash boxes.

jaent to the substation. This cabinet unit includes a panel with three over-load relays, ammeter, voltmeter and watthour meter. Advantages in using such a unit are minimum labor cost for installation, fully guarded live conductors and protection against the spread of fire.

The plant is entirely steel and concrete and the covering is corrugated galvanized steel, No. 24 gage on the sides and No. 22 on the roof. Floors are reinforced concrete except that Blaw-Knox  $1\frac{1}{4} \times \frac{3}{16}$ -in. gratings are installed between wash boxes. They also are used for stair treads. A "spot-heating" layout installed by the Stanton Heater Co., Martins Ferry, Ohio,

is designed to provide 1,300,000 B.t.u. at the necessary points when required.

In the design of the mine yard, car feeders and dump, the loaded tracks are level. Only the No. 1 loaded track (underground coal) is equipped with a car feeder, designed to handle a trip of 50 cars. Uncoupling for dumping takes place just after the cars are pushed over the hump after leaving the trip feeder and scale. This feeder is 31 ft. long, geared for a speed of 90 f.p.m., and has alternate pushers and retarders. Weighing is done in motion by a Toledo scale with "Print-weigh" attachment.

Scale, feeders, transfer table and dump were built large enough to

function equally well in case the present 4-ton cars are replaced with 7-ton 225-cu.ft. 8-wheeled cars similar to those in use at the company's Dun Glen mine (*Coal Age*, October, 1941, p. 80). These would be dumped *en train* at  $1\frac{1}{4}$  per minute. In dumping the present cars, which is done uncoupled, it was necessary for the dump operator to watch carefully that he did not start the dump rotating before the empty car had moved clear out. After some empties had been turned over on the floor an electric-eye interlock made by the General Electric Co. was installed, which put an end to that type of delay (see p. 67 of this issue).

## PROVISIONS

### That Will Assure Increased Safety In Operation of Mines by Electric Power

**B**ECAUSE of its efficiency, its convenience and its universal application, electric power in coal mines has been welcomed by some and tolerated by others. At the same time, it is berated because "it set off this explosion, started that fire and electrocuted one of our good men." The inference is that if rope haulage and air-driven machines could do the modern mechanized mining job, electricity would be discarded. At best, the safety engineer seems to look askance at this toleration and to have a yearning in his inner soul that some day a satisfactory power plant may be embodied in each piece of equipment, and all this network of wires and volts be consigned to the gob.

In mining operations, electricity has made many contributions to safety. Witness the miners' electric lamp, automatic haulage signals and adequate locomotive headlights. Electric power devices have been so greatly improved that many are declared "permissible" for even gassy mines.

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By F. W. RICHART  
*Editorial Staff, Coal Age*

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Although, in most states, the use of unprotected wiring carrying more than 275 volts is not allowed in coal mines, the open trolley operating at that voltage probably is guilty of more accidents and fires inside the mine than any other electrical device. Unfortunately, even that low voltage may kill if conditions are favorable. Fortunately, the circuit, of which a man may be a part, usually is of such high resistance that the shock merely surprises or discomforts him.

But even a surprise may prove fatal. A man in an Illinois mine touched a trolley wire, fell off his locomotive and broke his neck — causing his death. Trolley voltage often is fatal to men afflicted with heart ailments. Such men certainly should not be motor-men or helpers.

Men should not have to wriggle under a trolley wire in climbing into, or out of, a man trip. For those who think even 275 is too high a voltage for safety, it may be said that 100 volts may give a severe, even a fatal, shock if the circuit resistance is low enough. The safe rule is to treat all wires with respect—equal to that accorded to a pair of massive gears.

Roof falls and badly installed hangers have caused sagging or grounded trolley wires, which, in turn, have resulted in severe oil and coal fires and have exploded powder which was being transported in mine cars. The remedy would seem to be better supported haulway roofs and the transportation of combustible or explosive materials in electrically insulated cars. Possibly most explosives are so transported, but who would expect that a short circuit would burn through an oil barrel and start a nasty fire. Yet that also has happened.

Suitable roof supports for haulways may run into big money. That is only

partly an electrical problem, for roof falls still remain the major cause of fatal accidents. Both for an electrical and a safety-from-falls point of view, it would seem that main haulways having a prospective life of 10 or 20 years might justify such construction as would approach permanency. Certainly, use of untreated timber cross-bars and props is not justifiable from any point of view. With "Blitzkrieg" mining in rooms, less timber will be needed and what timber is used sometimes may be salvaged, affording economies that will provide funds for the erection of haulway supports such as will give security for the entire life of the mine.

Many mines have been equipped with expensive sectionalizing equipment designed to isolate automatically any section that has developed a short, and to reestablish power, if and when the short is cleared. There are many problems involved that depend on local conditions. Each mine has something different, and each such installation should be based on a survey of the conditions and of the demands for power, so that the breakers will be adequate and will function in a manner that will eliminate all hazard.

### Cleanliness Essential

These devices depend on the operation of sensitive relays. Cleanliness and freedom from corrosion are essential conditions for certainty in relay operation. For continuity of service, safety to operatives and length of useful life, they should be kept in weatherproof inclosures. The extra cost will be justified on the basis of any one of these three advantages.

Every motor around a coal mine, whether above or below ground and whether used for d.c. or a.c. power, should have its control surrounded by a waterproof inclosure, motors on locomotives being a possible exception. The added cost will run from 40 to 100 percent, but will be worth it. Tipple and washery builders insist on the installation of modern motors in all the plants they install. But they have been slow to insist on expending the extra sums involved in the incorporation of weatherproof or, in some cases, permissible motors and control. When and if they do so, their customers may complain of the price, but eventually they will rise up and call them blessed.

Some cutting- and loading-machine builders have adopted permissible motors and control. Others are on the way to this desirable consummation. This modern trend, required in gassy

mines, has already proved its value in reducing upkeep and in increasing availability.

From a safety point of view, weatherproof and permissible inclosures are of great benefit, because the covers are bolted on, and so, are troublesome to remove; therefore the men are less likely to indulge in unauthorized tinkering with them. In this connection, it has been noted that some weatherproof control devices may run temperatures that trip the motor off the line. This is especially true of starters having integral resistors such as are used for intermittent service. Proper adjustment of this defect can be readily made.



Oil-filled transformers should no longer be considered safe for underground service. Though in electric failures a small volume of irritating gas may be emitted from the non-flammable oils used in pyranol and similar transformers, these air-diluted fumes are not dangerous but merely irritating, whereas the carbon dioxide from an oil or other fire may cause fatalities. Unfortunately, these non-flammable oils cannot be used in old types of transformers because they destroy the varnishes used in such equipment.

Low voltage, which results from the use of conductors of inadequate diameter, is the chief reason for the heating of motors. Because d.c. motors will continue to turn over and drag their load, even though at a snail's pace, they often are allowed to continue doing so, without any effort being made to supply more adequate conductors, but the excess current thus passed through the motor either burns up the insulation or destroys its vitality.

Rubber insulation is especially susceptible to heat. Fortunately, the usual inside-of-mine temperature of 72

deg. F. (equal to 22 deg. C.) increases the rated current capacity of rubber-insulated cables by almost 40 percent—provided the cable is not reeled. However, when there are two layers on a reel all the gain is lost—and 10 percent more. Increasing the number of layers of cable on a reel rapidly reduces the carrying capacity of the cable, for with four layers the safe capacity of that conductor is only 50 percent of book rating—under the conditions just stated. Put into actual figures:

No. 2, single-conductor cable-reel cable.	.....	110 amp.
Rated capacity.....	.....	153 amp.
Underground capacity, two layers, 99 amp.	.....	
Underground capacity, four layers, 53 amp.	.....	

This indicates what may be expected to happen to cables, particularly when we remember that heating increases as the square of the current. Write that down with the fact that minimum cable-reel diameter is 24 times cable diameter, and you have the reason for most underground cable failures. Abrasive-resisting rubber will take terrific mechanical punishment and "stay put," but not if the life of the rubber has been destroyed by heat. As an offset, there are several things that may be done to prolong the life of cables and minimize the hazards from them: 1, provide rated voltage; 2, don't guess at cable currents and cable sizes; 3, unreel the cable when in use; and 4, provide larger reels.

### Ample Capacity Helps

What about oil-circuit breakers underground? Ample interrupting capacity *must* be provided. How much is needed depends on the rating of the power supply, but a surprisingly moderate premium has to be paid for the jump in interrupting capacity from 10,000 kva. to 20,000 or 25,000 kva. The inherent increase in safety more than offsets that extra expenditure. For places where the cost is justified, oil breakers are available that will not throw oil if they "blow up." Made of boiler plate and with provision for the escape of gases, they cannot explode. The present-day design and construction of oil-circuit breakers justifies their consideration on all such high-voltage and high-current a.c. circuits as are backed up with power—that is, with substations or generators.

To summarize: electrical manufacturers, having paved the way with safe electrical devices, use of sound engineering construction and reasonable human care, will eliminate most of the hazards of electric power.



This new Pursglove shop provides the room and equipment for inaugurating a system for periodic general overhauling of mining machinery.

## NEW CENTRAL SHOP

### Built From Old Tipple Steel Raises Maintenance Standards at Pursglove

SINCE a few years ago when the two mines of the Pursglove Coal Mining Co., Pursglove, W. Va., were changed from hand to mobile loading the officials have known that their maintenance system could stand improvement. So along with planning and installing extensive improvements in ventilation and drainage, time was found for making a study of maintenance. The conclusion was that it would be necessary to install some system of complete rebuilding of cutters, loaders and locomotives on a time and/or tonnage basis. That focused attention on the urgent need for more extensive repairing and rebuilding facilities, with the result that the company has just completed new additions to the central shop as well as to the local shop at No. 2 mine plus

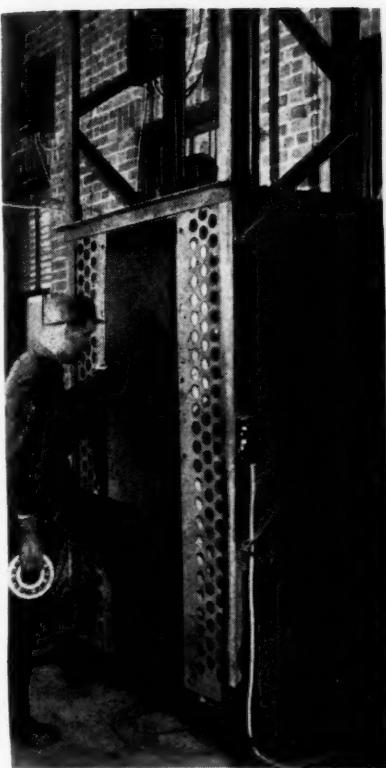
a complete new local shop at mine No. 15.

New equipment for materials handling and shop jobs has been added to the central facilities. A department with special equipment has been installed for rebuilding and rewinding electric coal drills which in the past have been expensive and troublesome items. The use of 500 volts d.c. in the mines is partly responsible for the electrical troubles. A number of broken-down drills were accumulated because new ones were purchased from time to time when there was a shortage of ones in proper working order. Twenty-two Joy loaders are in use in the two mines. One mine, No. 2, is in the Sewickley seam, and the other, No. 15, is in the Pittsburgh.

For some years the company has

maintained a central machine and electric shop out in the country about two miles away from the preparation plants and adjacent to the power house where all of the a.c.-to-d.c. conversion equipment for both mines is located. Here the new central shop was erected. It is a two-story steel structure with an elevator serving the second floor, which is the electrical winding room and drill shop.

Ninety percent of the steel was obtained from a tipple dismantled at the company's No. 4 worked-out mine. Floor dimensions of the new building are 48x78 ft. The eaves height is 28 ft. A 15-ton bridge crane, electrically propelled and controlled from the floor, serves the main bay of the first floor and has rails extending outdoors to a material storage yard. The upper



A. Zeni, shop mechanic, gets ready for a ride, via electric elevator, to the second floor.

floor, served by a 2-ton bridge crane with electric hoist only, has an open well above the main doorway through which medium to heavy materials can be hoisted to the upper floor. If desirable, these materials can be picked up for hoisting directly from the bed of a truck backed in through the main door.

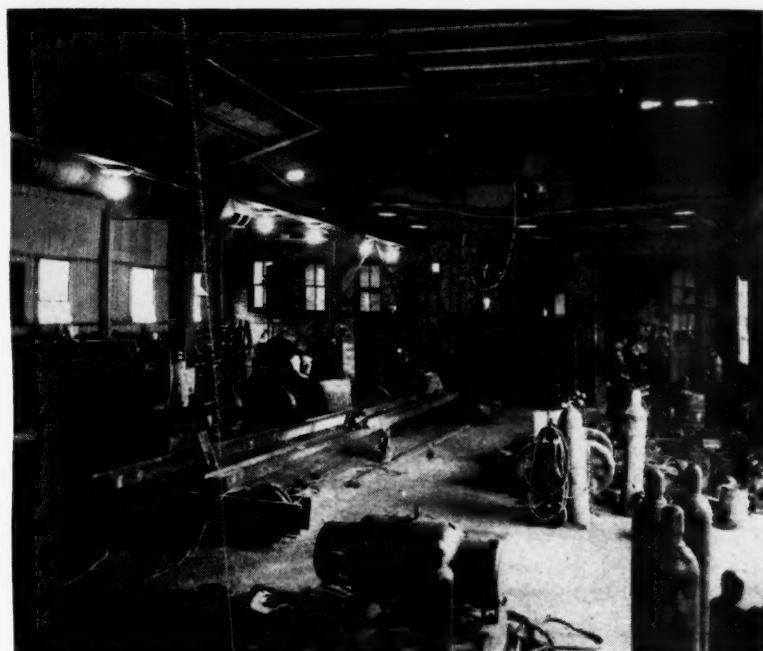
The first floor of the building, for the most part, will be used as a welding and erecting shop. Machine tools, such as lathes and shapers, will remain in the brick building adjoining. A 400-ton wheel press was installed in the erecting shop. For convenience and efficiency in maintaining the hydraulic pumps of loading machines, a testing machine of local design and build was added to the equipment. Special new facilities for the electric shop upstairs include a winding machine for fields and armatures of drill motors. Work benches and cabinets for tools and personal effects also are of steel. Consequently, the whole layout is fire-proof.

Instead of shop men using up their energies and spending undue time climbing up and down stairs on errands between the first floor and the upstairs electric shop, an electric elevator, built principally from scrap and surplus materials, was installed. It is of pushbutton type and is op-

erated by the man who does the riding. In some cases, where light materials are sent up or down, it is dispatched without a rider.

Added to the layout was a two-story cement-block building near the new shop. The upstairs accommodates the office of Victor Zeni, chief electrician and master mechanic. The downstairs serves as a small unloading depot for certain special materials dispatched to the mines from this central point.

Near the drift haulage portal of No. 2 mine, where Mike Seamon is the head electrician, the old shop, only 20x20 ft., has been expanded by a 36x40 ft. addition and a 5-ton bridge crane. At the portal of No. 1 manway for No. 15 mine, where Angelo Zeni is head electrician, a complete new shop (32x90 ft.) has been built. These two local shops, built after the central shop and after the steel pinch was on in earnest, are framed of wood and covered with the same material.

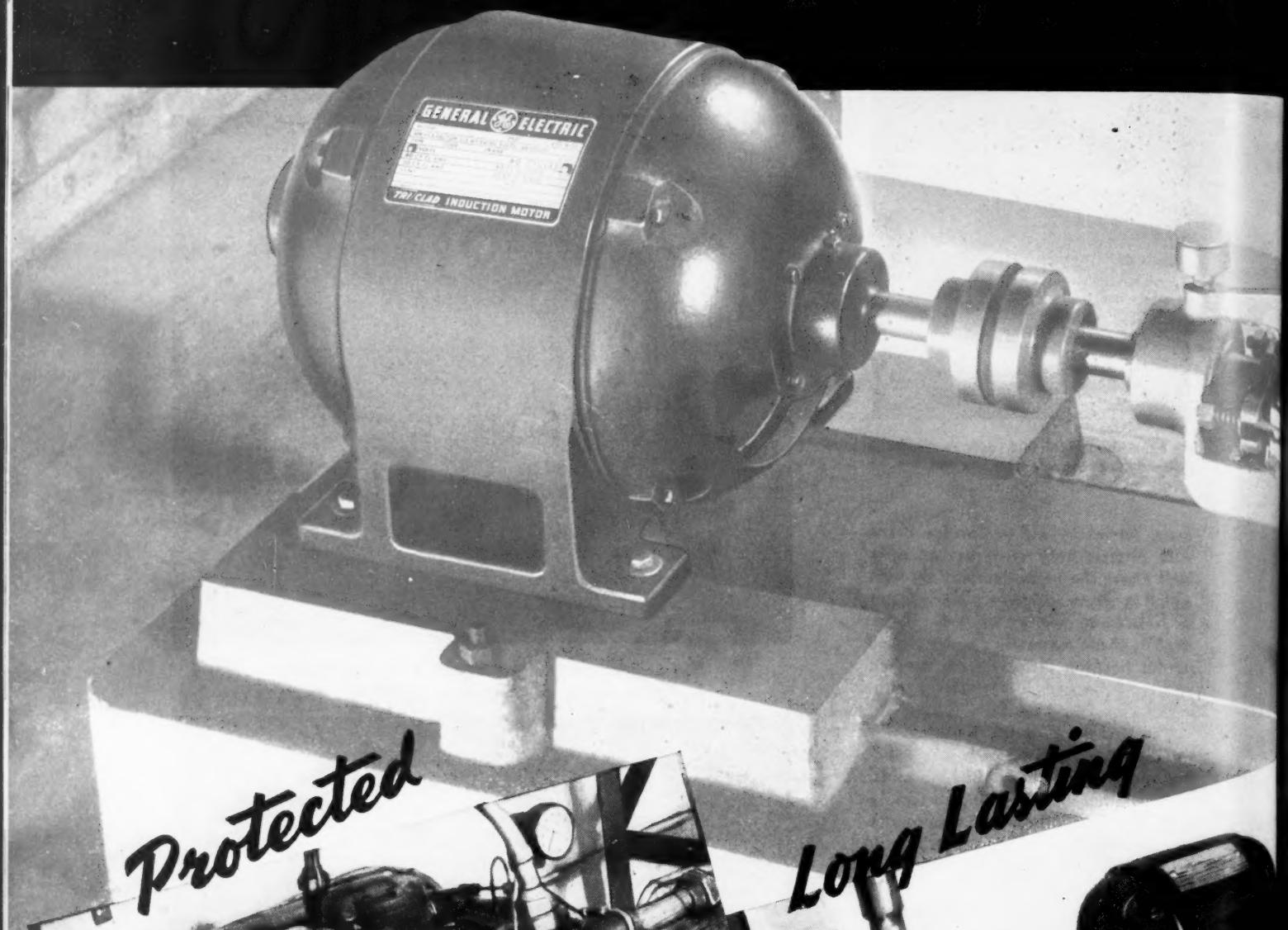


The ground floor is mainly a welding and erecting shop.



The electric and drill shop is on the second floor.

# MORE "STAYING"



Dirt and dripping liquids are ever-present enemies of motor operation in locations like this. But the smoothly contoured, cast-iron frame of this Tri-Clad motor guards it against damage.

This Tri-Clad motor is an excellent running mate for the chlorinating pump it drives. Its extra protection features—cast-iron frame, windings of Formex wire, improved bearings—are assurance of long life on important jobs.

BUILT FOR PROTECTION FIRST... TO LAST

# POWER<sup>®</sup>

## ON PUMPING JOBS

The extra protection of  
**TRI-CLAD** motors  
REG. U.S. PAT. OFF.  
helps to keep pumps  
DELIVERING

*Triple-shift operation is an old story to this Tri-Clad motor driving a coolant pump. If you, too, have pumping problems where staying power is a prime requisite of the pump motor, specify Tri-Clad—built to give years of service on tough jobs.*

*Reliable*

Here's a Tri-Clad splashproof motor driving an important pumping unit in a midwestern plant. Its operation in a place where dampness and heat are often present is typical of the dependable service so characteristic of Tri-Clad motors.

NOW—before you buy motors—is the time to solve your pump-motor problems. Wherever continuous pumping is essential to your production—wherever pumps must operate under adverse conditions—your motors must be secure against (1) physical damage, (2) electrical breakdown, (3) operating wear and tear.

Here's where the *extra*-protection features of Tri-Clad motors will help you get the triple-shift operation you need. Their cast-iron frames and end shields exclude falling objects and dripping liquids; their windings, of Formex wire, are resistant to oil, moisture, and heat shock; their improved bearings, completely sealed in cast iron, are protected against the entry of dust and dirt. All these features add up to *extra staying power* on jobs where 24-hour production is essential.

You'll be glad to know that Tri-Clad motors are now available up to 100 hp in standard, open construction, and in a wide range of other types and ratings.

### NEED MOTORS?

Four Things to Do to Get Them Quicker

- 1 USE STANDARD MOTORS. Wherever possible, select standard, open sleeve-bearing motors. Building fewer "specials" means faster and greater production of motors for you and others doing war work.
- 2 PLACE ORDERS EARLY. Order the motors when you order, or plan for, the equipment they are to drive.
- 3 SEND PROPER PRIORITY. Be sure correct priority reflects the urgency of the motor's order and that the priority rating reflects the urgency of the motor's use in the war effort.
- 4 CHECK G.E. for warehouse stocks. A supply of many standard motors is kept on hand to meet urgent war needs. Perhaps the motor you want, or can use with a few simple changes, is available for immediate shipment.

AND REMEMBER—keep the motors you have in top-notch shape. General Electric Company, Schenectady, N. Y.



General Electric and its employees are proud of the Navy award of Excellence made to its Erie Works for the manufacture of naval ordnance.

# GENERAL ELECTRIC

750-108-8030

# DUST CONTROL

## At Undercuts and Elsewhere Secured by Sprays on Shortwall Machines\*

**S**UPPRESSION of fine coal dust at the source has been the subject of recommendations to the coal industry in recent months. Modern mining produces more coal dust in shorter periods of time and the industry is faced with the problem of suppressing this dust in a practical and economical manner.

Dust produced underground may be classed as primary or secondary, depending on source. Undercutting, drilling, blasting and shooting may be considered primary sources. Loading, underground transfer of coal, transportation, miscellaneous operations such as moving men and machinery, timbering, air velocity, etc., may be considered secondary sources. Experience, backed by adequate test data, has indicated that controlling dust from primary sources reduces the volume from secondary sources. Undercutting is considered by the Pittsburgh Coal Co. as the principal primary dust source and therefore has been given first attention.

### Two Sprays Installed

*Spraying the Undercut*—Several of three makes of shortwall machines have been equipped with a spray on either side of the cutter chain on the front of the units, making two spray nozzles per machine. On two of the three types, the right- and left-hand sprays are approximately 6 in. above the bar and slightly outside the chain. Locating the sprays back of the front of the armature casing has been found best for maximum nozzle protection. When a recess is not available, special guards or hoods have been built.

Looking toward the working face,

\* Abstract of a paper entitled "Water-Tank Shortwall Spraying" read at the 1942 summer meeting of the Illinois Mining Institute.

**Marketing considerations influence the volume of spray water which can be used in dust suppression underground. Delivered B.t.u., handling characteristics, fine screening to specified limits and air-cleaning efficiency all are affected adversely by the addition of excessive moisture. Some of these economic and practical influences therefore must be considered in the use of water to suppress dust at the source.**

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By D. H. DAVIS

Pittsburgh Coal Co.

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the right-hand spray is a pencil-like jet directed to strike the chain as it goes into the kerf. Thereby the water is carried to the back of the cut. The left-hand spray is a fishtail unit bracketing the stream of cuttings brought out by the chain. If one nozzle clogs, considerable dust suppression is possible with the other. In these positions, also, the sprays are accessible for inspection and repair and can be protected against damage. Lastly, and very important, operation of the sprays from these points is not affected by the method of removing cuttings.

Dust reduction, according to some publications, has been achieved by attacking it in suspension by a fine mist and not by wetting the coal. Our work indicates that on shortwall machines it is not necessary to produce a mist, which would require pressures of 75 lb. per square inch or more. At 75 lb., if the moisture in the cut-

tings was to be kept under 1 to 1.5 percent, it was found that the orifice would have to be so small it could not be kept from plugging.

Our practice has been to use approximately 35 lb. at the nozzle with a 0.065-in.-diameter orifice. Tests with the jet alone resulted in a substantial dust reduction and indicate that high-pressure mists are not essential to good suppression. The turbulence and time interval between production of fines and ejection of cuttings are an advantage in shortwall spraying. By a jet on the ingoing chain, half the volume applied is carried to the point where the fines are produced and where turbulence and time aid in spreading the water.

### 12 to 15 Gal. Per Cut

In a 21-ft. place undercut 9 ft. deep, 12 to 15 gal. of water is being applied per cut when spraying at 35 lb. and 0.065 in. Moisture content of the cuttings is increased about 1 percent. Regardless of the method of supplying pressure water to the nozzles, the cutting-machine spray installations are the same. A  $\frac{1}{4}$ -in. pipe is extended from each nozzle to a point on top of the machine convenient to the operator. Near the end of the line is a globe valve and fitting, with a hose connection at the end. These three items are protected by a hood with one side open for access to the valve.

The hose provides a simple, quick connection between the spray installation on the machine and the source of the water. When tramping, the hose is coiled on top of the machine. The filter is a reducing tee filled with steel wool and cellulose sponge, with a plug in one end for easy cleaning. This type of filter has proved superior to others, in our opin-

ion. Where the orifice diameter is less than 0.065 in.—that is, 0.040 in. or less—a 1-in. pipe sleeve filled with cellulose sponge is used just ahead of the nozzle. Protection of the piping and nozzles is of paramount importance, as the entire spray system depends upon keeping these parts in operating order. A good filter also is essential.

**Water Distribution**—The bulk of the expense in spray-system operation is in water distribution. Hence, it must be given careful consideration. The number of dust sources to be controlled and the degree of reduction to be achieved must first be determined. If all operations in the production cycle are to be sprayed, water distribution by pipe probably is the most practical; if only one or two, then other methods may be adopted.

#### Pipe or Tank Supply

Some of the various methods for supplying water at the face are:

1. Pipe throughout the mine with water from a central source.
2. Pipe in working sections with water from a conveniently located dam or sump supplied by (a) track-mounted tank car, (b) drillhole tapping surface stream or (c) connection to mine drainage system.
3. Track-mounted car holding about 1,000 gal., which may be switched off the main track in the working section and the water distributed to the face by pipes.
4. Track-mounted tank hauled by the cutting or loading machines.

5. Tank built into the cutting-machine truck.

6. Small portable tanks holding 5 to 5½ gal. of water along with a compressed-air charge.

We have used pipe at the face only in experimental set-ups, but are using it regularly at loading heads and shuttle-car transfer points. As an experiment, also, a tank is hauled behind a shortwall.

**Tank Built Into Shortwall Truck**—To avoid additional equipment at the face, a 200-gal. tank has been built into the shortwall truck for supplying water while undercutting. The turntable and tilting frame are mounted directly on top of the tank. No change is made in tilting-frame length or the over-all height of the unit. The tank is internally braced and reinforced to form a substantial bumper. In other respects, the machine is no different from a standard unit.

A Dayton-Dowd 1-in. single-stage turbine-type centrifugal pump (1,750

r.p.m.) is directly connected to a 3-hp. 550-volt. d.c. approved motor, with pump and motor on one side of the tank truck.

A 30-ft. hose connects pump discharge and machine piping system while cutting is going on. When tramping, the hose is coiled on top of the machine. The pump also may be used for filling the tank merely by changing the valve, although this is more an emergency provision because of the time required. Filling usually is by gravity flow or pumping from a water-delivery tank or sump. The shortwall tanks hold enough water for 10 to 15 cuts, and

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**The spraying problem resolves itself into obtaining the maximum dust reduction compatible with reasonable cost and reasonable volumes of water. Spraying the undercut involves selecting a method of applying water during cutting, as well as a method of water distribution. The latter is closely allied to the quantity of moisture that may be added to the coal and will be influenced by the number of sources to be sprayed and the water volume necessary for adequate control.**

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the best filling method seems to be from a large tank (about 1,000 gal.) fitted with a 50-g.p.m. pump. Little time is required.

There are systems of mining, such as those using conveyors, where there is no track to the face and the cutting-machine truck is not used. To meet this condition, one of our men devised portable tanks of a 5½-ft. length of light boiler tubing with tightly welded end plates and fitted with a substantial valve. These tanks are charged with air and filled with water 5 to 10 at a time, and will hold a charge a week or more. Handles permit dragging them to the face. Total weight, filled, is about 100 lb. These tanks may be used in any face operations and are very cheap. To operate, the rubber hose leading to the cutting-machine spray system is coupled to the tank and the valve is opened to let the air pressure force the water to the nozzles. A cock on the cutting machine provides a ready means of control while cutting. Approximately 50

percent less water is used with the portable as compared with the cutting-machine tanks and a strong concentration of wetting agent is being added.

**Results of Spraying Undercut**—With spraying by the methods described, the dust concentration in the air when undercutting has been reduced 80 to 90 percent with quantities of water not detrimental to the marketing or handling qualities of the minus 3/8-in. coal. An attempt is made to fix the dust-forming fines to the larger particles so that they cannot subsequently disperse into the air. After four weeks of spraying the undercut, the dust concentration in one section before starting the undercut was reduced 67 percent. This indicates that dust from other operations, such as loading, is reduced by spraying the undercut.

#### Conveyor for Cuttings

**Conveyor for Removing Cuttings**—Because the newer shortwall machines produce cuttings faster, the scraper cannot remove them as they are formed. The addition of a conveyor will eliminate much of the hand shoveling of cuttings behind shortwalls. In England, where mining in bottoms is common, cuttings have long been removed mechanically. Several removal units have been built in this country recently, and preliminary results with one of these in our mines indicate that after improvements in design the slack conveyor will offer many advantages. These include:

1. Reduction in power consumption.
2. A clean undercut, permitting better preparation of the fall for loading and increasing lump yield. As bugdusting is a disagreeable job and isn't properly done all the time, the slack conveyor will minimize the human element in this operation.
3. Coarser slack, resulting from faster discharge of the cuttings and elimination of carry-back.
4. Dust reduction, according to results in England.
5. Reduction in labor for removing cuttings from the machine.
6. A decided increase in the life of cutter-bit points.

Two types of shortwall slack conveyors have been designed by one manufacturer. One operates straight back from the rear of the machine and the other at an angle of 45 deg. opposite the travel. The conveyors are clamped to the rear end and either can be easily disconnected from the machine for tramping.

# SUSPENDING FIVE FEEDERS

Sizes 2/0 and 1,000,000 Cir.Mil

In a 1,000-Ft. Borehole Near Portage, Pa.

FOR THE power cables at boreholes in coal-mine operations, many kinds of cable support have been used, some of which have been quite simple and yet satisfactory for their purpose. Others, however, have been open to several objections, chief of which has been the damaging of the insulation by clamps, either in lowering the cable or in anchoring it thereafter, and this has been particularly in evidence since lead-covered and armored cables to a large extent have been displaced by rubber-insulated conductors and since the cables have been required to carry currents of higher voltage. Furthermore, while the suspension of a single armored cable is comparatively simple, that of multiple individual conductors properly insulated presents a much more difficult problem, particularly when the borehole is deep.

## Ventilating Difficulty

As 5,000 to 10,000 cu.ft. of air per minute is needed to carry the heat from a 200-kw. motor-generator set located inside the mine and, because of the distance this air had to travel and the need for a separate split, a motor-generator set at the No. 2 mine of C. A. Hughes & Co., Cresson, Pa., was located on the surface, but, as a.c. was desired underground for pumping, a 440-volt a.c. line, rubber-insulated, was installed with the main 1,000,000-cir. mil cable carrying current at 250-275 volts d.c. In all, the weight of the cables, a.c. and d.c. was about 12,000 lb. (6 tons), most of which was suspended in the hole.

The 1,000,000-cir.mil cable had a diameter of 1.7 in. and weighed about 3.9 lb. per foot. It had a nominal breaking strength of 45,000 lb., or 22½ tons. Thus, the factor of safety

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on 1,000 ft. would be about 11½. The 2/0 cable had an outside diameter of 0.98 in. and weighed 0.915 lb. per foot. It had a nominal breaking strength of 5,900 lb., or 2.950 tons, and thus a factor of safety of about 6½. The cables were manufactured by the General Cable Co. and insulators and clamps were standard Ohio Brass products.

## Falsework Erected

To handle these safely and without damage to the insulation, falsework was erected to carry the sheave wheels and the drum over which the d.c. and a.c. cables respectively would be run, and also to support the chain blocks or tackle when, after the cable had been lowered into the hole, it became necessary to support the vertical load and relieve the load on the horizontal part of the cable.

Because of the different diameters of the cables and to avoid slipping on the surface, two independent drums or sheaves, one below the other, were provided. Fig. 1 shows this structure with grooved sheave wheels over which the d.c. cables were run. Directly below these wheels was a flat drum for the a.c. cables. The sheave wheels can be seen in the illustration, but at the time the photograph was taken the drum had been removed. The horizontal pull was imposed entirely on the ends of the cable through equalizing bars and was taken through reels on two trucks equipped with power winches carrying  $\frac{5}{8}$ -in. wire

rope. However, safety hitches with hemp rope over the insulation also were used.

Fig. 2 shows the connection to the ends of the d.c. cables and the position when the clamps were being applied prior to the removal of sheaves. In the illustration, the lower drum already has been removed. Fig. 3 illustrates the arrangement after the weight had all been taken by the clamps. The insulators were then attached, and the finished suspension is shown in Fig. 5, which also shows the ventilating duct that leads to the motor-generator set. This duct carries all the cables except those that go directly to the back of the switchboard.

## Ample Strength Provided

The cable clamps are designed to carry the cable when loaded to its ultimate strength and, as the strength of the cable allows for a factor of safety, the cable clamps have that same factor. An insulator will fail electrically under mechanical stress before it will fail mechanically. The large insulator is designed to carry a load of 36,000 lb. (18 tons) without electrical failure and will carry much more without failing mechanically. In the language of the trade, the large insulator has a mechanical and electrical rating of 36,000 lb. (18 tons); that of the smaller is 15,000 (7½ tons).

With this method of suspension, the cables are not damaged, the insulation is effective, the strength is adequate and the installation is completely enclosed and compact without any need for cable splices between switchboard and bottom of hole. The substation, as completed, is shown in Fig. 6.



Fig. 1—Falsework over borehole, showing sheaves.

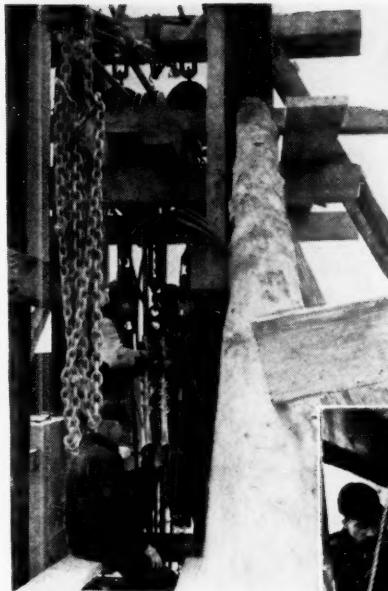


Fig. 2 — Securing cable and preparing to remove sheaves.

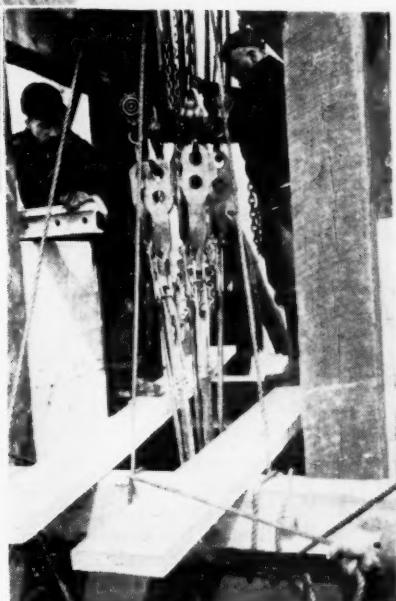


Fig. 3—Cable now solely on clamps.

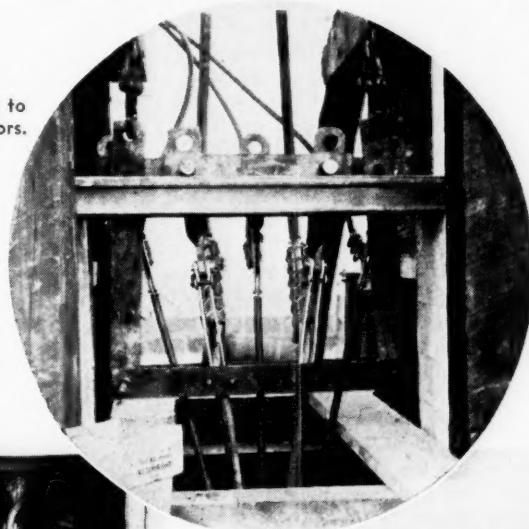
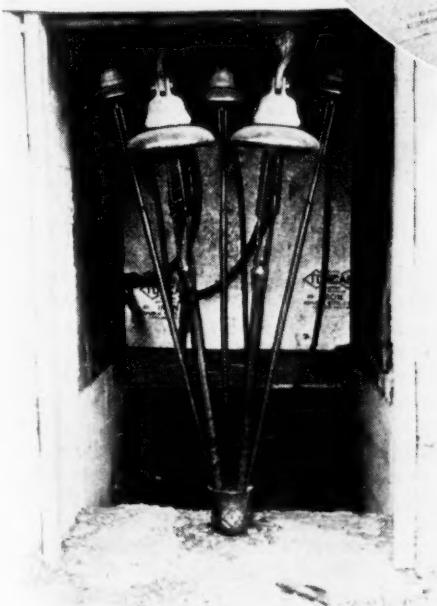


Fig. 5 — Final attachment with duct to motor-generator set.



Fig. 6—Substation at borehole.



# FOREMEN'S QUESTION FORUM

## How Electric Cables Can Be Used Underground And Yet Conserve Both Rubber and Safety\*

By G. F. NEWMAN  
Associate Coal Mine Inspector  
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BOTH safety and conservation of rubber are vital to the nation's war effort and to the mining of coal. The rubber rationing board recently found it necessary to reduce the rubber content of cable coverings so that those which hitherto have been 40 percent rubber will now be only 35 percent, and those which have been 60 percent will now be 50 percent, an appreciable reduction, but still it is believed that cables of good quality can be manufactured under the board's specifications. However, the board's action emphasizes the necessity for doing all that can be done to prolong the life of mine trailing cables.

*Cables Often Too Small for Current Demand*—Much mining equipment has motors ranging from 30 to 100 hp. On a 250-volt system, a No. 2 cable or one of larger size may be required to avoid destructive heating. In mines where voltage conditions are exceptionally good, a No. 3 cable can be used safely and economically; however, the mines with good voltage are the exception rather than the rule. On 500-volt systems, nothing smaller than a No. 4 cable generally should be used, for, though a smaller size may have ample electrical capacity, it may not have adequate mechanical strength to withstand the rough usage to which it is subjected and at the same time continue to assure safety to the men who have to handle it while the power is on.

### Trailing Cable Constant Hazard

In mechanical mining no hazard exceeds that of the trailing cable; a machine which is closed tight can be made reasonably safe, but one cannot be so sure about a cable that is dragged along the ground. The proper size of fuse plays an important part in the safe and efficient operation of mining equipment and in the protection of cables. The trailing-cable fuse should be of such size that, if either equipment or cable fail, the fuse will blow before serious burns occur.

*What Fuses Do*—Fuses of trailing-cable circuits give threefold protection: (1) Protection of motors from overload; (2) protection of supply system from short-circuit overload when cable or motor is damaged or fails; (3) limitation of current and its dura-

tion of flow, whereby arcing will be so reduced at the point of failure that ignition of cable insulation and sheath that in turn might cause an explosion or a mine fire will be rendered less probable.

When a cable is short-circuited or grounded, the current is limited only by the fuses or current-limiting devices at the power end. If the fuses are too large, or the current-limiting devices are set above the short-circuit rating of the cable, the latter probably will be damaged seriously. A good illustration of the misuse of trailing cables recently came to my attention. A No. 6 concentric rubber-covered trailing cable about 350 ft. long which was installed on a short-wall mining machine was completely ruined before a shift was finished and had to be discarded when, because of overheating, the cable blew out at several places; it was finally decided that the cable was too small for the work it had to perform.

*Mine Fire Caused by Splice*—A mine fire which probably was caused by a poorly made splice in a trailing cable of a mining machine resulted in the death of one person and several others had narrow escapes. This cutting machine was not provided with a cable reel, and the practice was to coil the cable in a crosscut, feeding it out or coiling it in another place as occasion required. The helper on the machine was paying out the cable from the crosscut when suddenly the cable caught fire, presumably from a short circuit in one of the splices, and in an instant was burning furiously. This burned off the insulation of a loading-machine cable nearby, which short-circuited, thus further aggravating the situation. Only with much difficulty was the fire controlled.

### Dangerous When Coiled

This fire is a good example of what can happen from improper use of trailing cables. While in actual use the cables were coiled in piles and thus became overheated, yet none of them ever was provided with a trolley tap fuse. All cables should be protected by a fuse or some other current-interrupting device that will open in case of trouble or overload, and cables should not be piled while in use.

*Keep Cables Off Floor*—Usually, at or near the face, on much of the electrical system in a mechanized mine, three trailing cables have to be provided, one for the mining machine, one for the face conveyor or loader,

and one for the drill. These cables, in many instances, are laid on the floor alongside the conveyors; occasionally under rocks, posts, conveyor pans, etc. Such treatment often damages the insulation and breaks the cable. Cables should be supported either on posts or on the rib so that they cannot thus be damaged.

At some mines, drill and face-conveyor cables are spliced without fuse protection to the mining-machine cable. This is an unsafe practice, as all cables should be protected by a fuse and one suited to the size of the cable used. Where small cables are attached to a larger cable without overload protection, a fire may result if the unit or the cable short-circuits. Unless suitable connections and both junction and distributing boxes are provided with which to make connections to the various face units, the cable is sure to be damaged. With the proper connection facilities, large lengths of cable need not be piled at any one point. The cables can be made up in suitable lengths and added or removed as the case may require. With shorter lengths of cables, the weight of cable that will have to be taken out and sent to the repair shop when splicing is necessary will be reduced.

With junction box and disconnecting plugs interlocked with a switch, a fuse, or circuit breaker for each circuit, the cables, being readily disconnected from the box, would be more easily changed.

### Importance of Good Return

*Don't Neglect Return Circuit*—Many mine operators fail to comprehend the importance of well-bonded tracks and adequate return circuits in preventing the heating and roasting of trailing cables. Return circuits are fully as important as feeder and trolley lines and should be given the same consideration. Invariably, where bonding and return circuits are in poor condition, trouble from overheated cables, roasted armatures, and field coils is severe; moreover, trailing-cable fuses must then be provided so large as to afford no protection to the operative, trailing cable, or machine. In fact, inadequate bonding is known to have caused fires.

*Parallel-Conductor Vs. Concentric Cables*—Parallel-conductor trailing cables have been found to be safest, because they will stand more mechanical abuse than concentric cables. Both cables have their advantages and disadvantages, but a concentric cable will spool more evenly on a cable reel than a parallel cable, and mistakes in splicing the wrong wires together are eliminated; also, this type of cable does not kink, and those handling it are less likely to be subjected to shock. Although the parallel cable is not as difficult to splice, it will not spool as evenly as the concentric cable.

From an ignition standpoint, the hand

\* Abstract of paper entitled "Precautions Necessary in the Use of Electric Cables Underground," presented at the Mine Inspectors' Institute of America, Monday afternoon, May 25.

cable on shortwall mining machines presents the greatest hazard because it is at the working face while the coal is being cut. It should be well anchored at both ends with strain clamps to prevent terminal strains and should be free of splices because, to some extent, it is handled by the machinemen.

**Don't Overfuse**—Several types of trolley-tap fuses for use on trailing cables for over-load protection are on the market. Usually with motors up to 50 hp., 100-amp. fuses should be ample for operation with 500-volt equipment. On 250-volt systems 150- to 200-amp. fuses should suffice.

Where trailing cables have been overfused despite a fair feeder and return power circuit, usually one of the following conditions, or a combination of them, has made that provision necessary: (1) cutting bits not properly shaped or sharpened; (2) bits not changed frequently enough; (3) cutting chain not properly assembled; (4) trailing cable too small, or chain and chain guides worn excessively. All cause overloading and overheating. Moreover, such defects augment materially power bill and maintenance cost.

#### Keep Cool and Save Rubber

**Keep Cable Cool**—Cables should not be coiled in large piles while equipment is in operation. If cable reels are not provided, the cables should be arranged or distributed over an area large enough to insure adequate ventilation. In some cases, this is accomplished by suspending the cable with long loops on pegs driven in the rib, but this method has its disadvantages. It was used at a mine for conveyor loading, 400 ft. of No. 1 twin-conductor cable being provided for each unit. The cable was supported on pegs driven in the rib about 12 ft. apart. From some unknown cause, probably a poorly made splice, the cable caught fire. As it was strung along the rib, the fire could not be smothered with rock dust and so it was difficult to fight.

Until satisfactory accessories are available for the proper handling of cables, the safest practice appears to be to distribute them over a wide area on the floor in some place where they will present no contact or stumbling hazard. Also, if there are any splices in the cable, they should be prevented from contact with coiled cables.

#### Nip Cable to Rearward

**Cable-Reel Hazards**—Sometimes cables are soon severely damaged because too great a length is left on the cable reel to permit of ample ventilation. This often can be avoided by attaching the cable nips to the power line far enough back from the working face so that only a small length of cable will be left on the reel. Where this cannot be done, the cable should be pulled off the reel. Heating of trailing cables on cable reels is more pronounced in mines using 250 volts than when 500 volts is used.

Damage to trailing cables left on cable reels during operation is greater than usually is suspected, particularly if the cable is loaded to capacity. When cables are used with one or more layers wound on a gathering reel, their current-carrying capacity is reduced as follows: With one layer of cable, 15 percent of its original value; with two layers, 15 percent; with three layers, 55 percent; with four layers of cable, 65 percent.

A twin-conductor duplex No. 2 trailing

cable has a rated capacity of 90 amp. when operating at a temperature of 40 deg. C. This same cable, placed four layers deep on a cable reel will have, without destructive heating, a current-carrying capacity of only 31½ amp. Several types of mining machinery are operated without the use of cable reels. The cables are trailed back of the machines as they travel from place to place, or they are loaded in and unloaded out of the conveyors as the machines are moved. One of the advantages of this method is that the cable generally is lying out in the open air and has an opportunity to be cooled; however, cables used in that manner are subjected to much more abrasion than reeled cables.

**Splices Give Trouble**—Another distinct advantage of unreeled over reeled cables is the fact that no splices have to be bent over the reel. Probably the greatest difficulty experienced with spliced cables is caused by constant bending of the cable around cable guides and reels; however, though unreeled cables are not subject to the high temperatures of reeled cables and the splices give less trouble, unreeled cables are subjected to much more abrasion and their average life probably is much shorter. Occasionally, trailing cables catch fire on the reels from poorly made splices. Unless splices are made securely, they will have such high resistance that they will heat seriously.

#### Heat and Cold Wreck Cable

When splices are repeatedly heated and cooled, they in time become loosened so that arcs from between the conductors set fire to the insulation. Sometimes splices, even though made mechanically strong, are so poorly insulated that they short-circuit between the conductors, firing the insulation. Many fires have been started from continuous heating and cooling of the cable terminal where attachment is made to the cable reel. It is good practice to check these terminals, at least monthly, to make sure that they are tight. On 250-volt systems, where voltage conditions are subnormal, the terminals may have to be checked more frequently to prevent heating.

**Make Good Splice**—Field inspection and all information at hand indicate definitely that it is splices in portable cables that determine their life and safety. So far as can be learned, very few cables fail due to improper design or construction. The cables generally are damaged by being run over by mobile equipment and by being left in places where they are bruised and sometimes cut in two in conveyor loading, by contact with conveyor pans and other miscellaneous materials.

Many experiments have been made to ascertain the best method for re-joining the conductors of a cable once they have been cut or burned in two. There is little doubt that the best splice is made when the rubber is vulcanized. It is absolutely essential to join the conductors together in a manner that will afford a strong mechanical and good electrical joint. To accomplish this, several splicing methods are used. None of them, however, provides mechanical and electrical strength and flexibility equal to that of the original cable.

How to join a conductor without depriving the section containing the joint of its desired flexibility is a difficult problem and

one which by no means has been solved. The problem can be handled better by prevention than by cure. A large part of the failures can and should be prevented by proper installations, closer supervision, and suitable instructions to the men responsible for handling. When trailing cables were far inferior to present-day equipment, the careless handling that was common and the damaging of cables were taken as necessary evils, more or less inherent in electrical mining. There are times and conditions, especially on gradients, where it appears impossible to prevent equipment from running over cables; however, it is believed that, when cables are properly installed and handled, much cable splicing and destruction can be avoided.

### Skirting Coal Piles Lessens Spontaneous Combustion

As a result of war conditions, the occasional practice of storing coal at mines may be revived. Experience has shown that coal piles that have their lower edges protected by a close skirting of boards or a concrete wall are less likely to catch fire than if not so protected. This fire-protection plan was devised and advocated by Carl Scholz, consulting mining engineer, Charleston, W. Va. He recommends boards 3 or 4 ft. long, set on end, and believes that piles catch fire because of the segregation of large coal at the foot of the coal pile, which allows air to enter the pile at that point.

He adds, however, that though the fire starts there, it moves up later to the top of the pile, where it can get air. This, it may be added, is due to the formation of carbon dioxide that makes continued combustion impossible in the heart of the pile. This movement of the combustion toward the surface has been noted by others.

The question arises naturally, why not liberate carbon dioxide, nitrogen or even methane, at the foot of the pile and so make the entering air so impure that the coal will not fire? That probably is just what happens behind the boards of the skirted pile. Carbon dioxide is formed in the part of the pile thus surrounded, oxygen is taken from the air, leaving nitrogen behind, and methane is liberated by the coal, all these together combining to form a low-oxygen atmosphere that will not cause the coal to heat.

Fresh air entering above the skirting mixes with this warm dioxide and with the naturally light methane and nitrogen as these gases rise. Thus no part of the pile receives really fresh air, as does the bottom of the pile when air enters along the floor, for none of the gases given out, created or concentrated by the coal will descend to the base of the pile. Apparently, not much study has been devoted to the ability of coal to oxidize or, as one is tempted to say, "preoxidize" or "carboxylate" in an atmosphere containing carbon dioxide, a nitrogen excess or methane or some mixture of these gases, but their presence undoubtedly dampens the action of oxygen.

Another theory is that the coarse coal at the base of the pile has a fine dust covering to which the air has ready access by reason of the looseness of the pile unless the pile is skirted. It may not be the coarse coal that fires; rather the fine dust with which the coarse coal is surrounded.

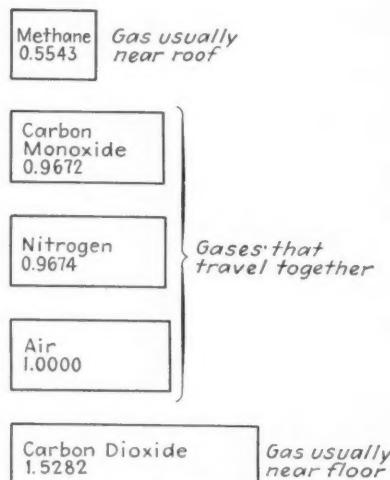
# QUESTIONS ASKED BY STATE BOARDS

## Quiz Presented Applicants for Certificates As Mine Foremen in State of Alabama

### Principal Mine Gases

Q.—(a) Name the three principal gases found in Alabama coal mines. (b) Give their specific gravities. (c) State where and under what conditions they may be found and how each may be detected.

A.—Presumably the two gases, nitrogen and oxygen, because they are found also in large quantities in normal air above the earth's surface are not intended to be included among mine gases, though usually they are the largest constituents of such air. Doubtless carbon dioxide, carbon monoxide and methane are meant. (b) Their specific gravities are: carbon dioxide, 1.5282; carbon monoxide, 0.9672; and methane, 0.5543, air being given a specific gravity of 1.0000 for a comparison of weights of gases, just as water is given a specific gravity of 1.0000 for a comparison of liquids and solids (U. S. Bureau of Mines I.C. 6983, January, 1938).



Specific gravities of gases named are proportional to length of blocks.

To put it succinctly, and not quite accurately, carbon dioxide is a half heavier than air, and methane is one-half lighter. (Also, nitrogen is almost as heavy as air. See illustration.)

(c) Carbon dioxide occurs in normal air, 0.03 percent usually being present, though slight variations occur. The quantity in mine air is much larger and increases steadily as the air enters the mine, but most carbon dioxide will be found in places having defective ventilation, or in places at a low level, or where shots recently have been fired, or

where men or animals congregate, or where much timber is present that has been standing a long time.

Carbon monoxide is associated with mine fires and explosions. It is found at the location of these occurrences or in places ventilated by air that has passed through such areas. The gas mixes freely with the air, being, as stated, of about the same specific gravity, 0.9672, as against 1.0000 for air, and being almost exactly of the specific gravity of nitrogen, 0.9672.

Methane probably is found in all underground coal mines, but in extremely small quantities in some coal workings, especially where, or so long as, the mine is well ventilated. Being extremely light, it is found more frequently in high-level places in the mine and near the roof, though the gas may

come from roof or bottom as well as from coal.

### How Much Air Is Needed?

Q.—On a return airway, 48,500 cu.ft. of air per minute is passing. A methane indicator or air analysis has shown the presence of 0.5 percent of methane gas in the air mixture. What is the total quantity of air per minute necessary to reduce the methane content to 0.2 percent? Show calculation.

A.—The quantity 0.2 is to the quantity 0.5 as 1 is to 2.5, as can be seen by multiplying both by 10 and dividing the resultant figure of the first, which is 2, into the resultant figure of the second, which is 5. As the percentage of methane is divided by 2.5, it must follow that there must be 2.5 times as much diluting air, and as there is 48,500 cu.ft. of air before that dilution, there now must be  $2.5 \times 48,500 = 121,250$  cu.ft., which is the answer.

## Queries Asked First Class Foremen At Examination Held in State of Ohio\*

### Diluting Methane With Air

Q.—If a mine is generating 500 cu.ft. of methane per minute, how much air must be circulated per minute to reduce the percentage of methane in the air to 0.05 percent?

A.—The methane percentage being 0.05, or one-twentieth of a percent, the quantity of air needed to accompany that quantity of methane will be roughly in the proportion of 100 to one-twentieth of unity, or 2000 to 1. Thus it will be necessary to provide  $500 \times 2,000 = 1,000,000$  cu.ft.

More accurately, the proportion of air to methane is  $99.95$  to  $0.05 = 1,999$ . Hence  $1,999 \times 500$  cu.ft. will be necessary, or 999,500 cu.ft.

I.—Describe what system of ventilation and general management you would adopt in a gassy mine to make mine explosions less likely and to keep the mine in a safe and healthy condition.

A.—I would arrange to haul coal in the intake current of air (see sketch (a) of the illustration), so that sparks from the trolley wire will not find any methane to ignite and so that fine dust from the mine face will not be distributed in the haulageway

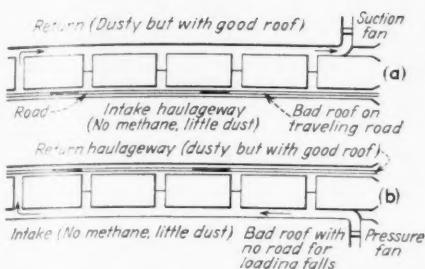
but in the heading in which the return air travels. When dust falls in the haulageway it may be ignited directly by trolley sparks or short circuits or indirectly from a flare of gas thus ignited.

This arrangement will put the return air in an untraveled heading and thus in one that it is somewhat difficult to enter for rock-dusting but with care to rock-dust this return airway thoroughly, safety will be assured. This method of ventilating also will result in more falls of rock occurring in the haulageway from the entry of intake air, which in summer will be made moist by entering the cool mine, but this difficulty can be met by guniting, by painting or by timbering and lagging the intake roadways and by diligent supervision and sealing of the roof of the haulageway.

With haulage in the return air current (see sketch (b) of the illustration) it is the roof of the untraveled airway that fails and consequently handling of this rock often is quite a problem, for either the tracks must be retained in the heading or must be specially constructed or the rock must be broken by sledging or shooting so that it can be laid down smoothly in the heading. Entrance to the return heading in any event causes loss of air. For these reasons, the rehabilitation of the heading often is delayed so long that ventilation suffers.

To promote safety, rock dust should be

\* Continued from May, 1942, *Coal Age*, 63.

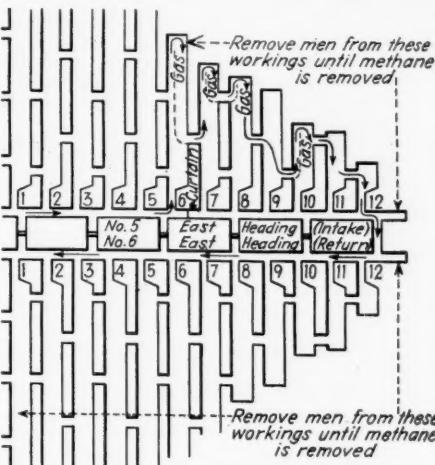


distributed over roof, sides and floor in both intakes and returns, also in crosscuts; rooms also should be rock-dusted up to within 30 ft. of the working face, though the Ohio law does not require rock dust to be used in rooms. This work should be done frequently so that the rock dust will be mixed with the coal dust. The rock dust should form at least 55 percent of the dust in the heading in a non-gassy mine and 65 percent in a gassy mine in accord with Sec. 898-48 of the Ohio State law. The material used for rock-dusting must be such as to go through a sieve which has 20 openings to the linear inch and at least half of it should go through a sieve with 200 openings to the linear inch.

**P.**—In a certain mine we have two headings known as No. 5 and No. 6 East. Twelve rooms are being worked in each heading. No. 5 East is the intake and No. 6 the return. The fireboss reports gas in Rooms Nos. 6, 7, 8 and 10 on No. 5 East. Explain fully how you would remove the gas.

**A.**—If any men are in these rooms or in

No. 5 heading beyond No. 6 room, they should be removed, as also all the men in No. 6 heading and in the rooms leading from that heading as the gas from the rooms, of which there must be quite a little, will make it unsafe to work in the places indicated. A curtain should be erected in No. 5 East across that heading just inby Room No. 6 to divert all the air up that room. Then



line brattices in Room No. 6 should be erected so as to carry the air to the face beyond the inby crosscut of that room. Line brattices should be erected also in the three other rooms, and this arrangement should be continued until no gas indication can be obtained.

## Questions and Answers Examination for Anthracite Foremen and Assistants\*

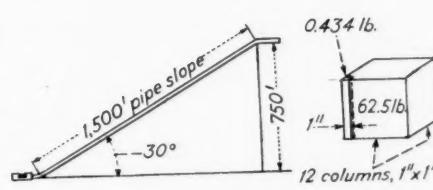
### Pressure on Mine Pump

**Q.**—A pump at the bottom of a slope 1,500 ft. long as measured along the slope and pitching 30 deg. is delivering water to the surface through a 10-in. pipe. What is the pressure per square inch at pump?

**A.**—When a slope pitches at an angle of 30 deg., the increase in depth is half as much as the distance traveled along the slope, and the standing, or "static," pressure on the water in a pump will be dependent not on the distance from the surface or on the size of the pipe but solely on the depth of the water in the pump below the point of delivery and the specific weight of the water.

To figure the standing pressure on the pump, the depth of the pump below the surface, one-half of 1,500 ft., or 750 ft., must be multiplied by the weight in pounds of a column of water 1 in. square and 1 ft. long, for the pressure that is wanted is in pounds per square inch. A cube of water 1 ft. high, wide and long weighs  $62\frac{1}{2}$  lb. and it can be visualized as 144 columns 1 ft. high and 1 in. square each of which will weigh  $62\frac{1}{2} \div 144 = 0.434$  lb. Static pressure on the water in the pump therefore is  $750 \times 0.434 = 325.5$  lb. (See illustration).

This static pressure is not the only pressure that the pump has to overcome. There is the



Slope on left and cube of water on right.

resistance of the water to traveling a distance of 1,500 ft. through a 10-in. pipe. That resistance will depend on the speed with which the water will be delivered. The faster the water travels, the more the resistance which will have to be overcome.

### How Much Oxygen for Life

**Q.**—What is the lowest percentage of oxygen in air that will sustain life?

**A.**—When no carbon dioxide is present in air, the oxygen content may fall as low as 14 percent before much difficulty is experienced in breathing, but air containing only 10 percent is no longer breathable and death by suffocation will occur quickly.

### Proving the Examination

**Q.**—What proof does the Pennsylvania Anthracite Mine Law require from the person who is delegated to examine all

\* Continued from June, 1942, *Coal Age*, p. 81.

working places each morning in a gassy mine that he has done as required, and what record must be made of such examinations?

**A.**—Art. 12, Rule 6 requires that he shall mark plainly the date of the examination at the face of each working place and all other places examined. Every report of examinations of workings, abandoned places, traveling roads, etc., shall be recorded without delay in a book which shall be kept at the colliery for the purpose, and he shall affix his signature thereto, declares Rule 7 of that article.

### Systematic Timbering

**Q.**—What, in your opinion, would be a good method of propping and timbering to prevent accidents from roof falls?

**A.**—Systematic methods of timbering should be established at each mine for each seam to suit their several conditions, and the miner should be required to follow that system, but, if in his opinion or that of the foreman, his section foreman or himself, more posts are needed, he should erect them also. The method should be determined by a close study of the nature of the roof and floor at each mine and seam, also the depth of the cover, the thickness and inclination of the seam, and the degree of stress at the working place.

### What Is First Aid?

**Q.**—(a) Describe briefly what is meant by "first aid to the injured." (b) For what kind of injuries in a mine would you render first aid?

**A.**—(a) First aid to the injured is the emergency care of a person who is injured or ill, to prevent death or further injury, to restore respiration, to relieve pain, to immobilize fractures, to check conditions known to endanger life, to prevent injuries from infections and complications, to counteract shock, to make the patient as comfortable as possible; where required, to transport the patient to medical assistance with no more discomfort, injury and shock than is absolutely necessary and to continue such ministrations until medical aid can be obtained. The imperative need of first aid for many injuries where medical aid is not immediately available makes it the duty of everyone to be able to render proper assistance until a doctor arrives or until the injured person can be taken to a doctor.

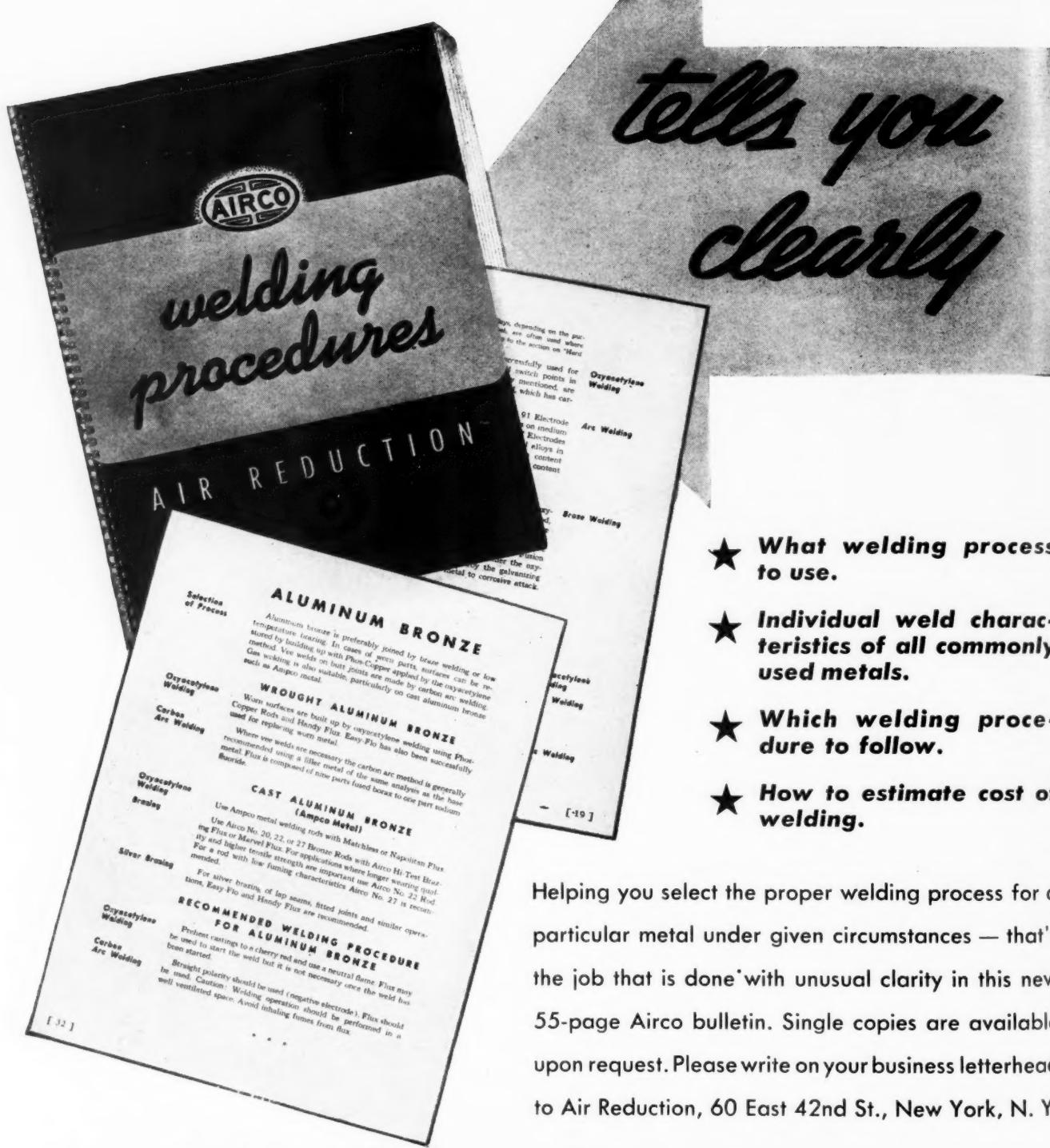
(b) First aid should be rendered to persons overcome by mine gases, suffering from bleeding, shock, burns, hernias, broken limbs, cuts and scratches or prostrated by heat.

### Most Dependable Ventilation

**Q.**—Which system of ventilation is most dependable—mechanical or natural ventilation? Give your reasons.

**A.**—Mechanical ventilation is to be preferred because with it the quantity of air circulated can be increased when desired, but, as dependence is being placed on machinery that may fail, mechanical ventilation should be provided with two sources of power. It also should not, if possible, oppose any natural ventilation present. Natural ventilation may reverse due to changes of temperature and changes in the direction of winds, and may sometimes disappear altogether. One cannot always depend on it.

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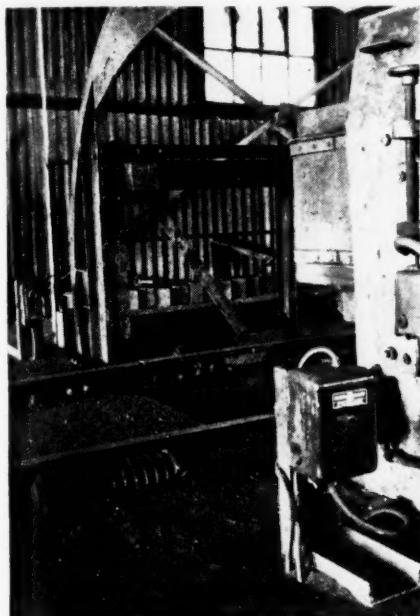


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# WHAT'S NEW IN OPERATING IDEAS

## Rotary Dump Is Interlocked By Light Beam Control

Electric eyes have been applied to a number of jobs in coal mining, such as opening mine doors, track signaling underground, controlling caging at the shaft bottom, warning of railroad cars approaching above or below tipple, and controlling refuse gates of washers. Another use akin to shaft-bottom caging, but above ground, is shown in the accompanying illustration. The light beam crosses the track at the empty end of a rotary dump at the new Piney Fork preparation plant of the Hanna Coal Co., in eastern Ohio (see p. 47 of this issue).



"Seeing" that the empty car is safely in the clear.

Mine cars are uncoupled for dumping, and for the reason offered later the dump itself is much longer than the car. The empty moves off by gravity as the loaded car enters. Operation is the usual wherein the operator pushes a button to start rotation of the dump after the loaded car is dogged and the empty has cleared the ring. Before the electric eye was installed the inevitable happened every so often. Perhaps a certain car was slow to move off or perhaps the operator failed to concentrate; at least the button was pushed before the empty cleared, resulting in the empty being turned over on the floor.

Now, the pushbutton control circuit remains open as long as the light beam, which is 14 in. above the floor, is blacked out by the body of the passing empty car. The equipment was furnished by the General

Electric Co. In the illustration, the beam unit is in the background (center left) and the control box in the foreground. The extra length of the rotary dump provides for the possibility of changing to much longer cars some time in the future.

## Automatic Flight Scraper Fixes Settling Tank

An operating problem—sludge sticking to the flights of the settling tank conveyor—at the washing plant of the Pruden Coal & Coke Co., Pruden, Tenn., was solved in a simple way by the local officials. The solution was based on providing a three-section scraper blade which descends by gravity into the path of the flight as it comes up around the tail sprockets. The scraper-blade support is pivoted at the right distance and angle to cause the blade to slip out across the face of the flight, thus scraping it free of the sludge.

Fig. 1 shows the principle and Figs. 2 and 3 depict the blade in two positions relative to a traveling flight. In Fig. 2 the blade is just completing its cleaning job. After the

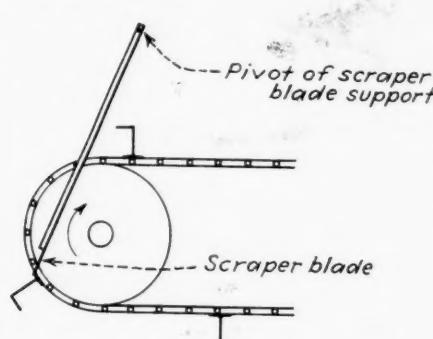


Fig. 1—Blade in position as it begins to scrape a flight.

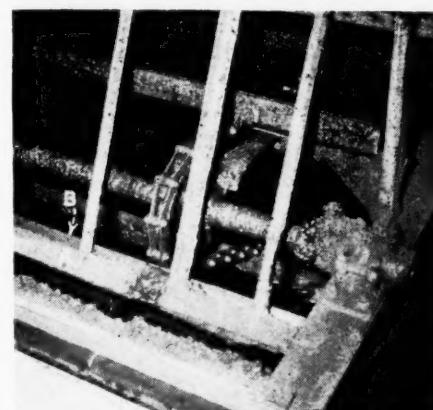


Fig. 2—Blade "A" is just completing the scraping of flight "B."



Fig. 3—Support arm "C" of blade "A" is riding on cleaned flight "B," which is moving up and over.

cleaned face leaves the blade the latter and its supporting arms ride on the outer face of the flight. This flight, however, has moved out of the way in time to let the blade down to intercept the dirty face of the succeeding flight. Blades are in three sections because of the necessity for providing two gaps to clear the sprockets.

At this central preparation plant for the Pruden mines  $2\frac{1}{2} \times 10$ -in. coal is washed in a Jeffrey diaphragm jig. The settling tank is a 12x50-ft. rectangular concrete basin at ground level, with the two strands of the sludge conveyor extending its full length. The material which sticks to the flights is for the most part of minus-48 mesh.

## New Coupling on Trailers Removed a Difficulty

To obtain hitchings which perform satisfactorily and have a long life has been a problem in rubber-tired tractor-trailer gathering in mines of the Hart Coal Corporation, Mortons Gap, Ky. Mine officials believe that W. R. Taliaferro, shop mechanic, has supplied the answer. The accompanying illustration, made in the mine shop, shows the new hitching on a recently completed drop-bottom trailer. Originals had a modified ball-and-socket hitching.

The coupling allows three movements: twisting, turning, and up and down. The back swivel is a 2-in.-diameter pin through a steel block and with a collar welded to the end. Next comes the up-and-down pivot, which is a 1-in. pin. Both of these are lubricated through Zerk pressure-gun grease fittings. Connection to the tractor is a 1-in. coupling pin.

This new trailer has a 3-in. square axle through the body instead of stub axles, as was a feature of the design of the original



Three-way universal coupler on a new type trailer.

trailers purchased in 1937 and 1938. The through axle adds greatly to the strength, allowing an increase in body size 1 ft. greater in width and 1½ ft. in length. Dimensions are now 7 ft. 3 in. x 12 ft. Height of the sides remains the same, 31 in. when empty. The back is 8 in. lower, however, and the present 22-in. dimension makes it possible to handle larger lumps without dragging the roof and damaging the loading-machine rear conveyor.

#### Rubber Chute Sheds Fines To Centrifugal Dryer

Rubber licked the problem of minus 1½-mm. coal carrying 25 percent moisture sticking to the original steel chute feeding it to the C-M-I continuous centrifugal dryer at the new Piney Fork washing plant of the Hanna Coal Co., in eastern Ohio (p. 47 of this issue). Even though the bottom of the chute was only 30 deg. off vertical, the coal would pile up and avalanche by slugs



In front is the centrifugal dryer with rubber-bottomed feed chute and in the background a rubber-tube bypass.

into the dryer or would clog entirely. Installing a sheet of rubber in place of the original steel plate proved a satisfactory solution. Flexing of the rubber due to impact of the material keeps the chute practically free.

In the accompanying illustration, which includes the conical cover of the dryer, the darker portion of the chute above it is the rubber, which is bolted to a skeleton frame of steel. In the right rear is a tubular chute, also of rubber, serving as a bypass for this wet minus 1½-mm. coal in case the centrifugal dryer is out of commission. Total length of this chute is 12 ft. The bottom section is a straight tube of 12-in. uniform diameter and the upper flares to 24 in. at the top.

#### Maintenance Savings Offered By Welding Methods

A number of opportunities for maintenance savings in the mining industry through hard-facing, welding, bronze-welding and bronze-surfacing were the subject of an article in a recent issue of *Oxy-Acetylene Tips*. Some of these are abstracted as follows:

A strap-iron clamp permits such accurate alignment of the broken cast-iron gear shown in Fig. 1 that no machining was necessary

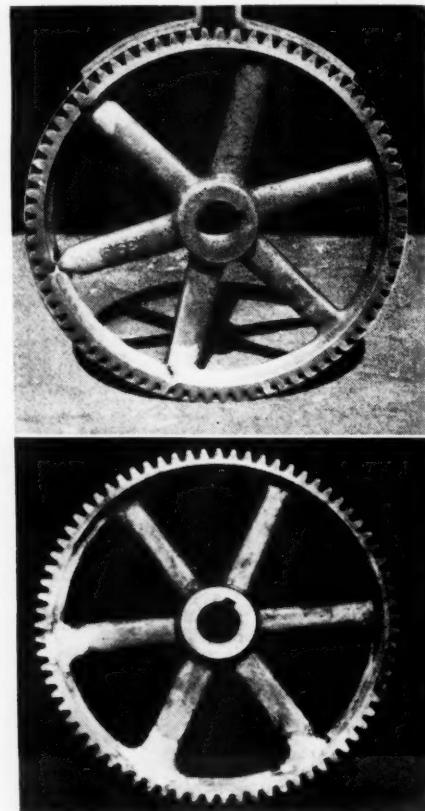


Fig. 1—Top, showing strap-iron clamp in place on broken cast-iron gear; bottom, completed gear after bronze-welding.

after bronze-welding. Joints were ground from the inside, leaving a small face for lining up. The repair was made with No. 25 M. bronze rod.

"Strong, light-weight pulleys can be fabricated, largely from scrap materials, at half the cost of bought pulleys." An example is

#### Sine Qua Non

"Without which not" is the literal translation of the tongue twister above. In ordinary language, it stands for something absolutely indispensable. Perhaps a knowledge of the latest kinks in operation, electrical and maintenance work and safety might not be absolutely essential to coal-mining men but it comes pretty close. This department is operated on that theory, and accordingly solicits your money-saving or safety-promoting ideas. If you have one, send it in, with a sketch or photo also if it will help to make it clearer. For each acceptable idea, Coal Age pays \$5 or more on publication.

shown in Fig. 2. "The side frames, top piece and attachments of this pulley were cut from steel plate, bent to shape by local heating and bronze welded by No. 25 M. rod."

The damaged cast-iron roll crusher saddle

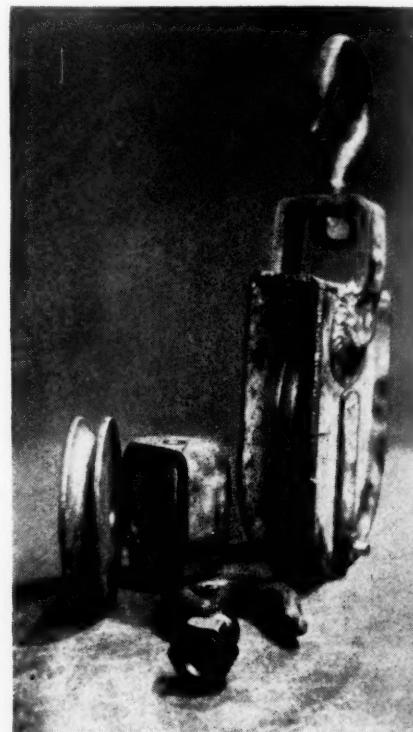


Fig. 2—This light-weight pulley was fabricated largely from scrap materials.

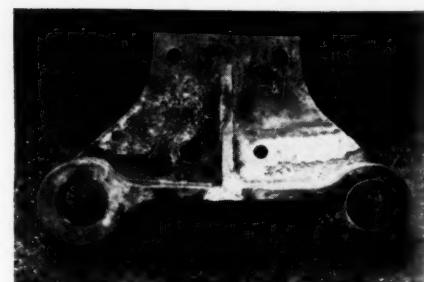


Fig. 3—Cast-iron roll-crusher saddle after reclamation by welding.

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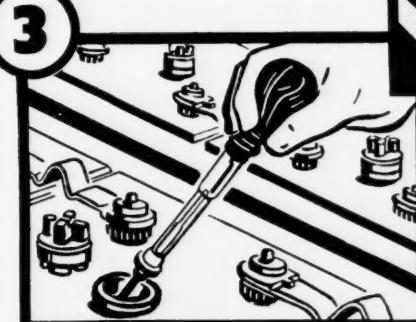
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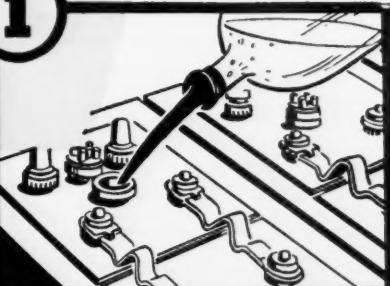
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shown in Fig. 3 was reclaimed from the scrap pile by bronze-welding the broken section (No. 25 M. rod). The success of this repair job led to a reclamation drive that salvaged many similar parts previously discarded and now hard to replace.

"An interesting method has been devised for building up worn pistons for diesel engines, using No. 9 cast-iron rod for the piston head as far back as the bottom compression-ring groove, which must withstand extreme heat. No. 31 T. bronze rod is used for the remainder of the wearing area." A piston  $18\frac{1}{2}$  in. in diameter is shown at the top in Fig. 4 after being built up and below after machining.

"Safety ladders are but one of the many useful items fabricated from stock materials

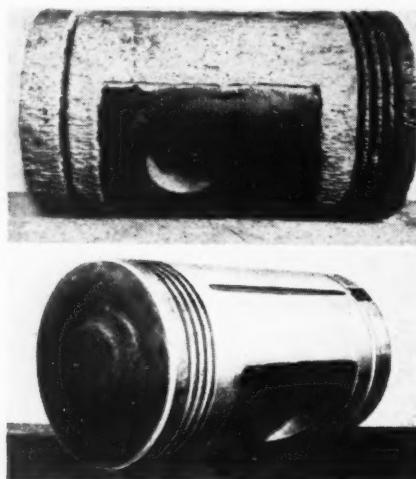


Fig. 4—Top, worn diesel-engine piston after rebuilding; bottom, same piston after machining.

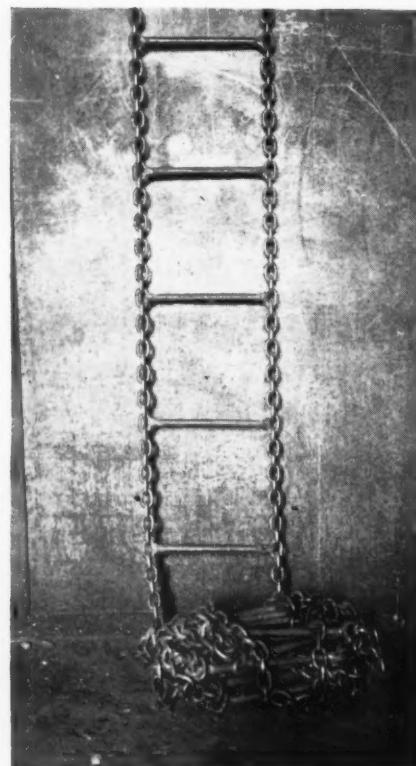


Fig. 5—Chain-and-pipe safety ladder fabricated by welding.

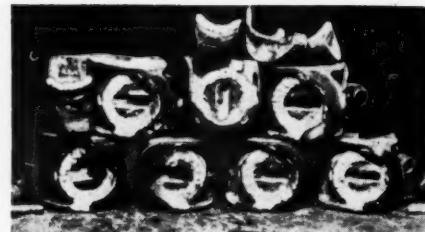


Fig. 6—Drilling-machine post saddles and cones after surfacing and before machining.

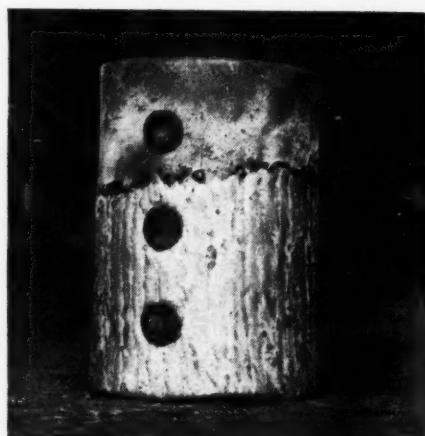


Fig. 7—Conveyor-belt idler pulley after selective building up by welding.



Made of heavy plate and with a deep center, this bumper resists all forms of distortion.

### Welded All-Steel Bumper Takes the Raps

Bumpers have been made with wood fillers and with spring backing to partially absorb the shocks that fall to the everyday lot of the mine locomotive. Evidently these forms of construction have come off the worse for collisions and other accidents, for the trend of today's design seems to be to make them strong enough to take the worst that comes.

Ernest Prudent, chief electrician, Bell & Zoller Coal & Mining Co., Zeigler, Ill., designed and built this all-steel arc-welded bumper for a main-line locomotive to take everything that comes its way.

### Signal Shows When Pocket Needs to Be Emptied

Previous to the installation of an automatic coal-pocket signal, says R. S. Woolcock, division electrician, Lehigh Valley Coal Co., a man had to be kept above the coal pockets to signal to the men on the loading road below when any pocket became so full of coal as to approach overloading. Unless such a man was provided, some of the pockets would actually overflow, and it would be necessary to stop the feed to this section of the breaker, thus causing lost time.

A simple automatic device now takes charge and makes its own signals. A Westinghouse track switch is mounted, as in the attached sketch, with a long wood paddle extending into the pocket, the weight of which causes it to rest on the roller of a track switch keeping that switch open. As the coal rises in the pocket, it pushes the paddle to the right, allowing the switch to make contact, thus lighting a lamp on the jig floor and also on the loading road. After the lamp is lighted, coal can continue to flow for 4 or 5 minutes before the pocket will be full and in that time a car can be placed under the pocket into which the coal can be loaded. Each light is in a steel box with a perforated number in front of it so that the number will be lighted when contact is made. Thus, there is no doubt as to which pocket is in need of attention for the numbers are 8 in. high and they can be seen from one end of the loading road to the other. The lamp remains alight until the coal is drawn off, when the paddle falls, thus opening the switch. The length of the paddle depends on

Fig. 8—Straps built up by bronze-surfacing.

by welding [Fig. 5]. Short pieces of  $\frac{1}{2}$ -in. standard pipe are welded to two lengths of chain, using No. 1 'High Test' steel rod. The ladder is flexible and strong, and will not be readily damaged by flying rock if struck during blasting."

"The reclamation of drilling-machine post saddles and cones is a routine maintenance operation in many mines. These worn saddles and cones [Fig. 6] are shown after bronze surfacing and before machining. No. 31 T. bronze rod gives the parts excellent wear and corrosion resistance."

"Selective areas can be bronze-surfaced where needed. Since one side of this conveyor-belt idler pulley [Fig. 7] became worn in service, bronze weld metal was applied only to that side. The job took  $1\frac{1}{2}$  hours and required 3 lb. of No. 31 T. bronze rod."

"When straps become worn they are bronze-surfaced with No. 31 T. rod in  $1\frac{1}{4}$  hours of welding time [Fig. 8]. After cooling, the excess metal at the adjoining edges is filed off and the two parts are bolted together and machined. Total cost of reclamation is only about \$6, while replacement cost would be about \$50."

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coal output for Victory  
—decrease costs to meet  
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Timken Bearings.



The fires of Victory are hungry for fuel. To keep them fed, we must mine more coal than ever before. Mining equipment of all kinds must be speeded up and given greater endurance.

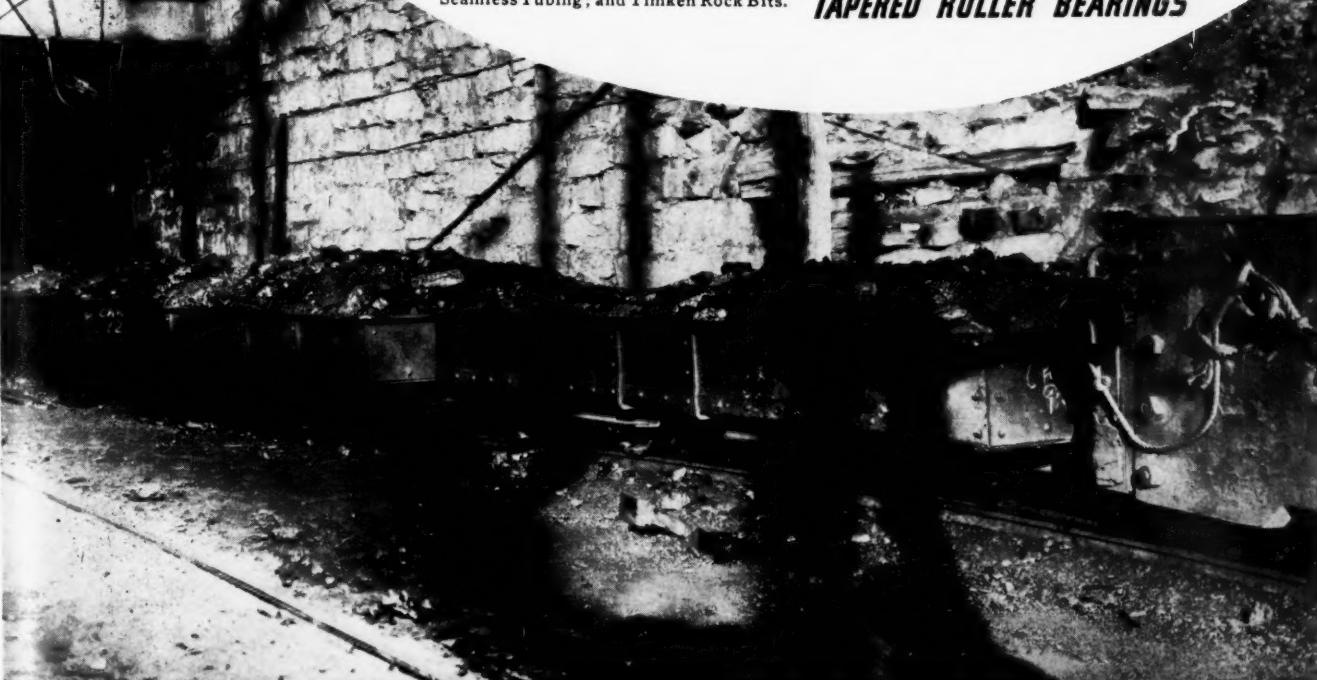
One way to do this is to make certain that Timken Tapered Roller Bearings are specified for mine cars, mine locomotives, conveyors, hoists, crushers, screens, etc.

Shown are some of the 1,500 Timken Equipped mine cars as purchased and used by Lillybrook Coal Company. By using bearings designed to handle all mining conditions, these cars, after years of service, are in excellent running condition today. It will pay any mine operator, in time to come, to accept only Timken Bearing Equipped mine cars. Over 400,000 have been placed in service for dependable rolling and minimum upkeep cost for their owners.

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Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.

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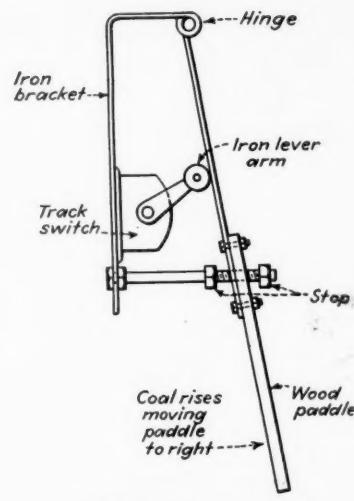
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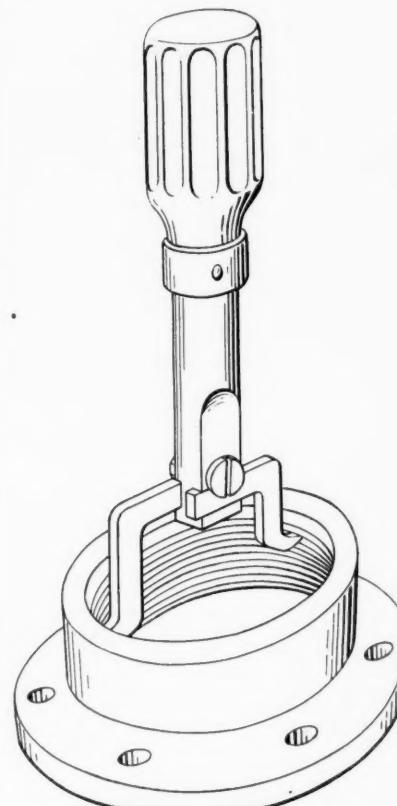


Watches level in coal bin.

the speed with which the particular size of coal is made and delivered to the bin. Thus chestnut coal has the longest paddle.

### Adjustable Thread Cleaner Has Wide Range of Use

Any mechanic or repairman, writes Chas. H. Willey, Penacook, N. H., will appreciate the design of the thread cleaner shown in the accompanying illustration, and will at once recognize its adaptability for cleaning by chasing the threads of a wide range of sizes of threaded parts. Good tempered steel is used in the blades, mounted on a steel shank in strong handle. The blades are secured in slots by a large-headed screw and nut.



# MORE NEWS

## FROM THE FIELD

### National Coal Association Observes 25th Birthday

The National Coal Association rounded out 25 years of activity on June 27. On that date a quarter century ago, a committee, meeting in Washington, adopted a resolution to the effect that there should be a national organization. This committee was composed primarily of local coal operators' association secretaries from all sections of the country.

In recognition of the historical character of that meeting in 1917, out of which grew the national organization, a booklet has been prepared and a copy is being mailed to all on the association's list. N.C.A. hopes that the booklet will prove of historic interest, indicating the origin and original organization of the association and those who played a prominent part therein.

### Schuylerville Stripping Installs Washing Equipment

Coal-washing equipment consisting of four Deister Concentrator Co. tables, capable of handling 100 tons of coal an hour, has been put in operation at the Schuylerville Coal Corporation strip mine north of Rushville, Ill. Water is furnished from a storage lake holding 12,500,000 gal.

### University of Illinois Offers Mine Engineer Scholarships

Three scholarships in mining engineering in the Department of Mining and Metallurgical Engineering at the University of Illinois, Urbana, Ill., are available to residents of the State of Illinois. Each scholarship has an annual award of \$100 and continues for four years of study.

Two Peabody Coal Co. scholarships each year for entering freshmen are preferably restricted to employees, or the sons of employees, or former employees of the Peabody Coal Co. One is to be awarded in the North-Central mining district and one in the Southern mining district.

One Illinois Mining Institute scholarship is offered each year to an entering freshman, awards being limited to young men from mining communities within the State of Illinois who have had actual coal-mining experience or who are the sons of men now actually employed in the coal-mining industry.

### Superior Mines Reopened

Superior Nos. 1 and 3 mines of the J. O. Clark Heirs Partnership, Lochvale, Pa., have been reopened and are being operated as the Clark Coal Division of the partnership. The "B" or Miller is mined and the miners are served by the Pennsylvania R.R.

Previously operated by the late J. O.

Clark, State Senator from Glen Campbell, the mines were closed down when Senator Clark died in 1936. At one time they produced in excess of 150,000 tons annually. New equipment, including double-decked shaker screens, picking tables, crusher, etc., are being installed in order to bring production to its former level as soon as possible. Aaron P. Clark, Philadelphia, is managing partner, and William H. Huffman, Glen Campbell, is superintendent of production.

### Keeping Step With Coal Demand

#### Bituminous Coal Stocks

	Thousands		
	Net	P. C.	Change
	Tons	From	From
May 1		Apr. 1	May 1
1942	1942	1941	1941
Electric power utilities	14,767	+6.4	+63.8
Byproduct coke ovens	8,404	+6.6	+69.1
Steel and rolling mills	1,050	+3.6	+45.6
Railroads (Class 1)	10,816	+9.1	+91.1
Other industrials*	20,705	+8.6	+79.6
Total	55,742	+7.7	+74.8

#### Bituminous Coal Consumption

	Thousands		
	Net	P. C.	Change
	Tons	From	From
April			
1942	1942	1941	1941
Electric power utilities	4,722	-5.7	+13.4
Byproduct coke ovens	7,187	-2.5	+12.2
Steel and rolling mills	863	-9.8	-8.8
Railroads (Class 1)	9,194	-5.4	+31.2
Other industrials*	12,584	-5.9	+19.8
Total	34,550	-5.2	+19.0

\* Includes beehive ovens, coal-gas retorts and cement mills.

#### Coal Production

##### Bituminous

Month of May, net tons	48,250,000
P.c. change from May, 1941	-1.5
January-May, 1942, net tons	237,030,000
P.c. change from Jan.-May, 1941	+30.1

##### Anthracite

Month of May, 1942, net tons	4,843,000
P.c. change from May, 1941	-5.4
Jan.-May, 1942, net tons	24,385,000
P.c. change from Jan.-May, 1941	+15.8

#### Sales of Domestic Coal Stokers Vs. Oil Burners

	Coal	Oil
	Stokers	Burners
April, 1942	9,573	4,864
P.c. change from April, 1941	-3.5	-69.9
January-April, 1942	34,506	34,565
P.c. change from Jan.-April, 1941	+13.6	-24.4

#### Index of Business Activity\*

Week ended June 13 (preliminary)	182.1
Percent change from month ago	-0.6
Percent change from year ago	+15.8

\* Business Week, June 20

#### Electrical Power Output†

Week ended June 13, kw.-hr.	3,463,528,000
Percent change from month ago	+3.1
Percent change from year ago	+11.7

† Edison Electric Institute.

### Alloy No. 2 Mine Leads In Safety Competition

Alloy No. 2 mine of the Electro Metallurgical Co., Alloy, Fayette County, W. Va., made the best record for safety among bituminous mines in 1941, according to the U. S. Bureau of Mines. It will be awarded the Sentinels of Safety trophy donated by the *Explosives Engineer* magazine. The mine operated 335,060 man-hours last year without a lost-time accident. Certificates of honorable mention have been awarded four other mines which finished second, third, fourth and fifth, all operating during 1941 without a disabling injury.

Finishing second was Winton No. 1 mine, Union Pacific Coal Co., Winton, Wyo.; third, Jellico mine, Jellico Coal Mining Co., Mountain Ash, Ky.; fourth, No. 15 mine, Island Creek Coal Co., Holden, W. Va.; fifth, Good A-22 mine, Good Clay & Coal Co., Beels Landing, Pa.

### Smoke Problems Studied At Cleveland Meeting

The Smoke Prevention Association of America, Inc., held its 36th annual meeting June 2 at the Hotel Statler, Cleveland, Ohio. Among the papers were the following: "Coal and Its Relation to the War," Thomas J. Thomas, Associate Director in charge of Bituminous Coal, Office of Solid Fuels Coordination; "Report on Dust Fall Survey in Cleveland Over Four-Year Period," Arthur E. Hutchinson, Smoke Abatement Engineer, Cleveland; "Ohio Coals," H. M. Faust, research engineer; "Smokeless Heaters—Dream or Reality?" Ralph A. Sherman, Battelle Memorial Institute; "Railroad Practices in Abating Smoke From Locomotives and Eliminating Air Pollution," J. P. Driscoll, master mechanic; "Influence on Atmospheric Pollution of the Exhausts From Diesel Locomotive Vehicles and Locomotives," R. J. Bender, combustion engineer; "Fuel Economy on Railroad Locomotives," Theodore Olson, superintendent of Motive Power, Oelwein, Iowa.

The following officers were elected: president, Arthur E. Hutchinson; first vice president, W. E. E. Koepfer, secretary, Pocahontas Operators' Association; second vice president, George P. Kenworthy, Wabash Ry.; secretary-treasurer, Frank A. Chambers, chief smoke inspector, Chicago; sergeant-at-arms, W. H. Dempsey, Chicago, Milwaukee, St. Paul & Pacific R.R. Following the election, Pittsburgh, Pa., was selected as the place for holding the 37th annual meeting.

### Battle Creek Property Leased

C. L. Barrett, of Marion County, Tennessee, has leased the properties of the Battle Creek Coal & Coke Co., Orme, Tenn., and was scheduled to begin operations late in June.

# WILLISON Automatic Couplers SPEED Mining Operations



The WILLISON Mine Car Coupler has been designed to provide AUTOMATIC coupling of mine cars, and to speed up the hauling and dumping operations to keep pace with modern mechanized mining methods.

Willison Couplers allow rotary dumping of cars in train without uncoupling.

Furnished with either spring or friction draft gear for any type of car.

**NATIONAL MALLEABLE & STEEL CASTING CO.**  
CLEVELAND . . . . . OHIO



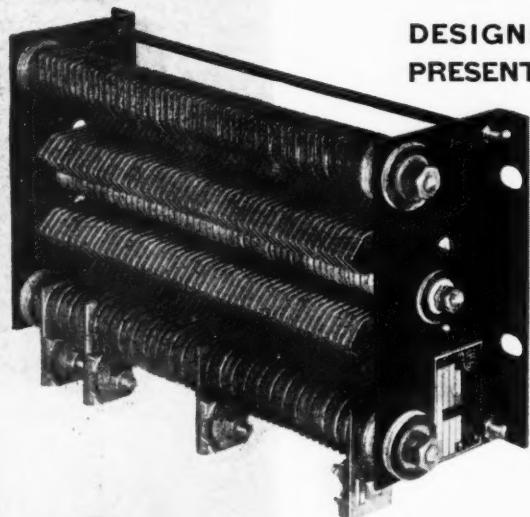
A. C. Fieldner

## A. C. Fieldner to Receive Melchett Medal

The Melchett medal, awarded annually by the Institute of Fuel, of England, for outstanding achievement in work involving the scientific preparation or use of fuel, will be presented this year to Dr. Arno C. Fieldner, Chief of the Technologic Branch and Chief of the Coal Division, U. S. Bureau of Mines, according to advices received from the Council of the British Institute of Fuel by the U. S. Department of the Interior. Ordinarily the Melchett medal is presented personally to the recipient in London, England, in October, but under present conditions the Council of the Institute of Fuel has stated that it may arrange this year for the formal presentation to be made in the United States.

A native of Ohio, where he attended the public schools and the State University, at Columbus, Dr. Fieldner launched his successful career in scientific fuel research soon after he received his college degree. He spent two years as an industrial fuel engineer and chemist with private industry, and then joined the government service in 1907, at the age of 25, as a chemist in the Technologic Branch of the U. S. Geological Survey. Two years later he became a member of the staff of the Bureau of Mines fuels chemistry laboratories and after a while was placed in charge of that work. In 1919 he was made supervising chemist of the Bureau and later also was appointed superintendent of the Bureau's Central Experiment Station at Pittsburgh, Pa. Outstanding work won for him successive promotion to chief chemist, chief engineer of the Experiment Stations Division with headquarters in Washington, D. C., and, in 1936, to the positions which he now holds as head of the Coal Division and Chief of the Technologic Branch.

## DESIGNED TO FIT YOUR PRESENT RESISTOR SPACE



Built of steel and mica—nothing to break—no warping or hot spots—constant in resistance value, regardless of temperature or age. Not affected by vibration, moisture or corrosive fumes. Continuous trouble-free service is assured with . . .



*"The Resistor you can Install and Forget"*

**THE POST-GLOVER ELECTRIC COMPANY**

ESTABLISHED 1892  
221 WEST THIRD STREET, CINCINNATI, OHIO

## Buys Trojan No. 3 Mine

Trojan No. 3 mine, at Gipsy, Indiana County, Pa., has been purchased by the Maryland Coal & Coke Co. through its subsidiary, the Maryland Trojan Coal Co., which has renamed it the Cush Creek mine. In acquiring this mine the company obtained access to an adjoining tract of 1,200 acres.

of virgin coal which is to be developed for a larger output than the mine has heretofore produced. Daily output of 400 to 500 tons is to be attained when present plans for development are completed.

**Bituminous Coal Research  
Reelects Officers**

Howard N. Eavenson, Pittsburgh mining engineer and consultant, has been reelected president of Bituminous Coal Research, Inc., research agency of the bituminous coal industry and affiliate of the National Coal Association. Two new directors, W. C. Hull, vice president, Chesapeake & Ohio Ry., Cleveland, and Kenneth A. Spencer, vice president, Pittsburgh & Midway Coal Mining Co., Kansas City, have been named by the stockholders. All other officers and directors are being continued in office.

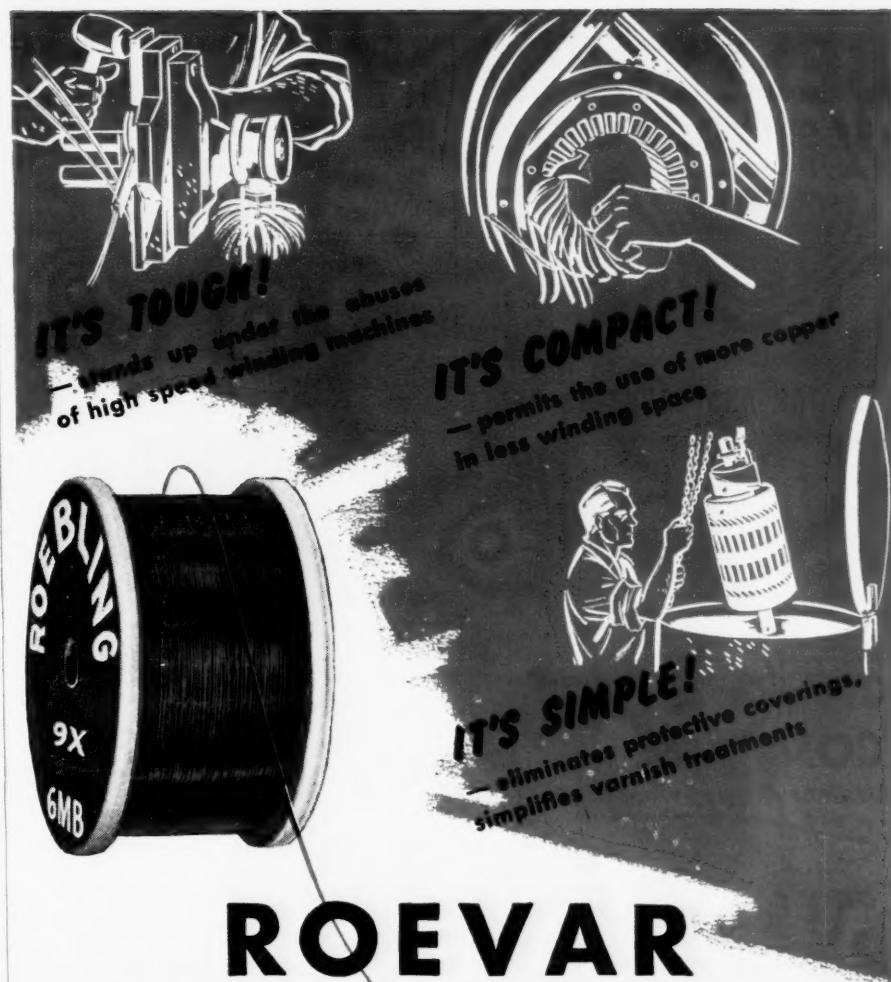
Other officers, in addition to Mr. Eavenson, are: E. R. Kaiser, Battelle Memorial Institute, assistant to the president; L. W. Householder, Rochester & Pittsburgh Coal Co., Indiana, Pa., vice president; R. H. Sherwood, Central Indiana Coal Co., Indianapolis, Ind., vice president; M. L. Garvey, treasurer; C. A. Reed, National Coal Association, Washington, D. C., secretary; and J. F. Hanley, National Coal Association, assistant secretary-treasurer.

The board of directors is composed of J. E. Butler, president, Stearns Coal & Lumber Co., Stearns, Ky.; E. H. Davis, executive vice president, New York Coal Co., Columbus, Ohio; Irvin Davis, president, Hatfield Campbell Creek Coal Co., Cincinnati, Ohio; B. R. Gebhart, vice president, Chicago, Wilmington & Franklin Coal Co., Chicago; H. A. Glover, vice president, Island Creek Coal Sales Co., Huntington, W. Va.; John A. Howe, executive vice president, Truax-Traer Coal Co., Chicago; Ralph E. Jamison, vice president, Jamison Coal & Coke Co., Greensburg, Pa.; J. B. Morrow, president, Pittsburgh Coal Co., Pittsburgh, Pa.; S. S. Nicholls, president, White Oak Coal Co., New York City; D. H. Pape, president, Sheridan-Wyoming Coal Co., Monarch, Wyo., and Messrs. Hull, Spencer, Eavenson, Householder and Sherwood.



H. N. Eavenson

Reelected president, Bituminous Coal Research, Inc.



## **ROEVAR** *the new Synthetic Resin insulated* **ROEBLING** *Magnet Wire*

It's a big step forward in magnet wire insulation! Here are the advantages of Roebling ROEVAR Magnet Wire in a nutshell:—

**Low cost**—generally less than enameled, fabric-covered types.

**Smaller**—allows more copper in the same space,—the same amount of copper in less space than the enameled, fabric-covered types.

**Flexible and abrasion resistant**—retains its flexibility and maintains its dielectric strength under high tension and abuse of severe winding conditions.

**Eliminates need for cotton** or other protective coatings—reduces the amount of treating varnish used after assembly—is not affected by the action of asphaltic compounds, naphtha and other varnish solvents.

If you have a winding problem, ROEVAR may provide the solution.



**JOHN A. ROEBLING'S SONS COMPANY**

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TRENTON, NEW JERSEY

Branches and Warehouses in Principal Cities



# BELTSAVER

THE EXCLUSIVE MONARCH



Wing Type  
**TAIL**  
**PULLEY**  
**SAVES**

## ELEVATOR AND CONVEYOR BELTS

"Beltsaver" is as far ahead of the open face pulley as a B-19 Bomber is ahead of the "flying piano boxes" of World War I. "Beltsaver" is especially recommended for use as an elevator boot pulley on conveyor tail pulley when handling sand, gravel, stone, ore, ashes, coal and similar sharp, abrasive materials. Users report belt life increases of from 50% to 100% over that which they obtained when using a solid face pulley. "Beltsavers" are made in standard sizes and are interchangeable with solid face pulleys.

## COMPARE:

Ordinary Type Solid Face Pulley



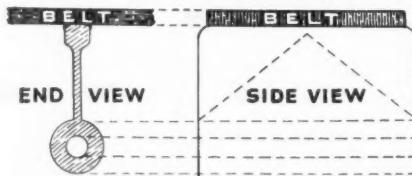
## WITH "BELTSAVER"

Wing Type Tail Pulley



### ONLY 20% OF PULLEY PERIMETER TOUCHES BELT

Note the cross sectional end and side elevations. End view of rounded wing (Left Below) shows contact with belt. Face surface of these wings is wide enough to pull without harm to belt, and because they represent less than 20% of the total pulley perimeter, "Beltsaver" offers less than 1/5 the wearing surface of an ordinary solid face pulley. Note the exclusive wing and cone design of "Beltsaver" provides runways which allow material to escape—thus preventing



its being pressed into the unprotected under side of the belt—causing abrasion and serrations.

"BELTSAVERS" are made in standard sizes and are interchangeable with regular face pulleys. Send for data sheet with complete diameters, sizes, faces, and prices.

## SPROUT, WALDRON & CO.

140 Sherman St. Muncy, Pa.  
 Designers, Engineers, Manufacturers  
 Since 1866

## Wide Range of Coal Problems Spotlighted At Rocky Mountain Institute Meeting

(Continued from page 44)

(1) taking out a purchaser's license; (2) selecting duly authorized employees to issue explosives, having each of them apply, with the company's written indorsement, for a foreman's license, and having only licensed foremen issue explosives; (3) maintaining a complete record of all explosives issued or returned and the name of the licensee issuing or receiving them; (4) prompt reporting of losses or theft of explosives to the nearest explosives investigator or the director, including wiring to the director collect if there is a series of losses or more than 10 lb. is missing; (5) similar prompt reporting of unlawful removal of explosives from premises by employees; (6) posting of 'Explosives—Keep Off' sign on premises upon which magazine is located; (7) granting entry to premises at all reasonable times to explosives investigators or other officers of the U. S. Bureau of Mines. . . .

Coal was first discovered in Wyoming as early as 1834, said J. M. Sampson, State coal-mine inspector. Mining on a commercial basis did not commence until 1868, however, and the office of State coal mine inspector was created in 1886. Now, the law requires that all mines in which five or more men are employed must be inspected at least once every 60 days; less than five men, every 90 days.

"Operators of large and small mines are accorded the same treatment, as the department insists that each observe the laws of the State." Small operators, however, seem to have more difficulty complying. "Inspect-

ing properties where large tonnages are mined is, in most instances, a pleasant task for all inspectors because large tonnages cannot be mined unless everything that goes to make up a good producer has been brought up to date and slipshod methods are not tolerated. Good ventilation, good haulage roads and good equipment are the essentials."

Most Wyoming mines have exhaust systems of ventilation. Many mine managers augment the main ventilating unit with blowers and tubing. "However, in all mines where methane is generated the air current is conducted to the face by substantial line brattices." No granular black powder is permitted in any coal mine. "Black pellet powder still is used as a blasting agent. We expect to eliminate this hazard at the next session of the Legislature." Electric cap lamps are used in mines producing 93.52 percent of the State output, with rock-dusting carried on in operations producing 76.59 percent. "Mobile loaders have in no way added to the dangers of coal mining in our State. . . . Falls of roof and haulage still are the principal contributors to accidents, both fatal and non-fatal.

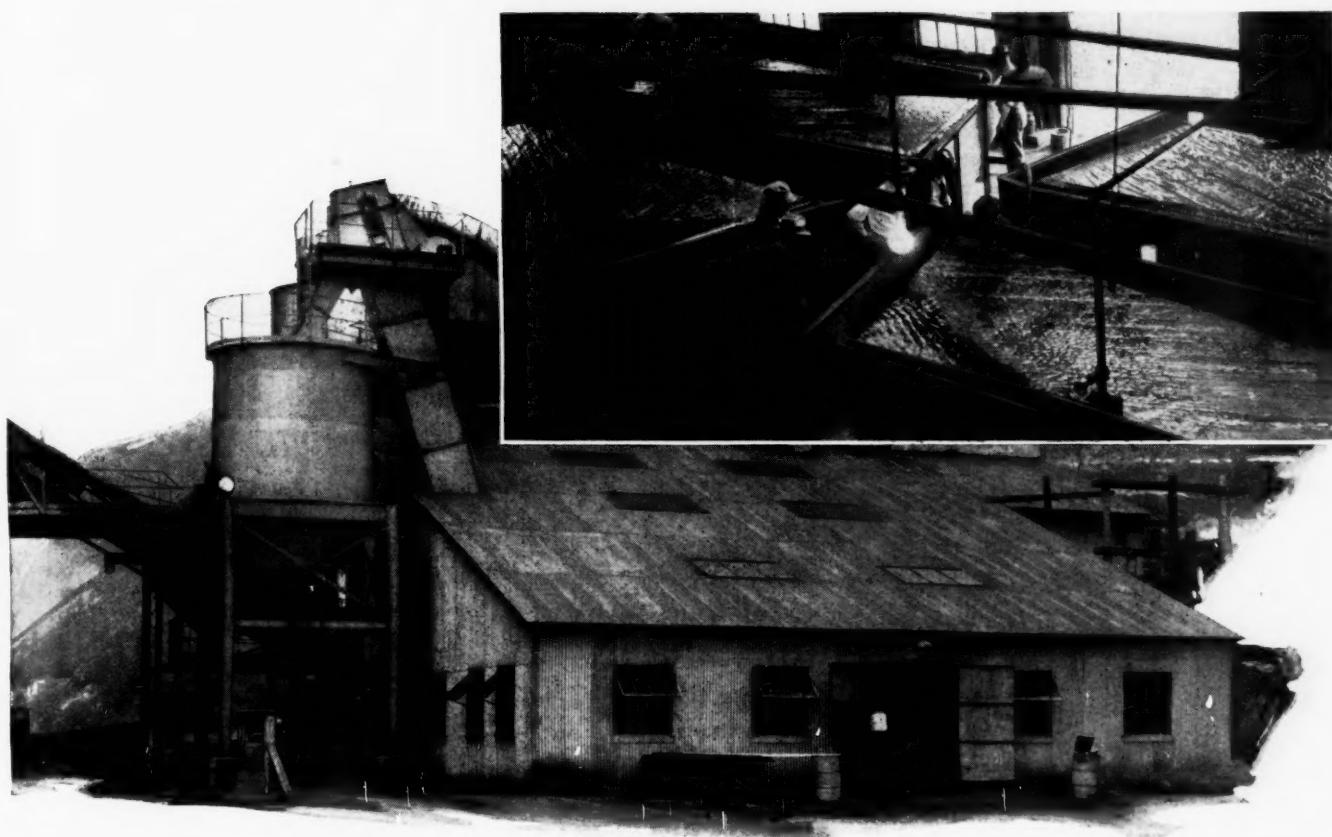
"First-aid training among the miners of Wyoming has reached a high degree. Safety is the one important factor in their lives. The State mine-inspection department has contributed little to bring about this great educational first-aid and safety-first program, but we are just as proud as if the whole thing had been our own special baby. While it is true that we still continue to have serious and semi-serious accidents, it is our honest conviction that the day is not far distant when, through the continued efforts of the mine management, the miner, the Bureau of Mines and the State agents, mine accidents from any source will become a thing of the past."

### Two Rounds in 3 Shifts

Two rounds approximately 6 ft. deep in about three shifts was the average achieved in driving an 8x12-ft. rock tunnel 2,600 ft. long with a shaker conveyor and duckbill at Reliance, Wyo., reported John E. Willson, resident engineer, Union Pacific Coal Co., in a paper read in his absence by M. A. Sharp, assistant superintendent. Drilling time averaged 3½ hours per round and loading time 6½ hours, including temporary timbering, changing pans, etc. The finished job required 4,500 man-shifts, including installing the permanent steel timbering. Time from breaking ground until completion of the tunnel was eleven months.

The first 300 ft. of the tunnel was made by the cut and cover system, using a dragline and trucks. With side walls on a 1 to 1 slope, the cut was 2 ft. at the portal, increasing to 21 ft. at 300 ft. Upon completion of excavation, track was laid and the tunnel proper started. As the tunnel advanced, 200 ft. of concrete portal and 100 ft. of steel timbering was installed in the open cut. The steel (4-ft. 6-in.x6-in. legs at 15.5 lb. per foot and 12-ft. 10-in.x8-in. bars at 45 lb.) was

# KEEP YOUR COAL OUT OF THE GOB PILE



The Rochester and Pittsburgh Coal Company was confronted with the problem of reclaiming the coal from the material formerly discarded as refuse.



Honored with the  
Navy "E" for excellence  
in war production

## H & P PRODUCTS FOR THE COAL INDUSTRY

TIPPLES, SCREENING and  
CLEANING PLANTS  
ROTARY DUMPS - CRUSHERS  
CONVEYORS - REFUSE CARS  
CAR HAULS and RETARDERS  
BOAT LOADING and  
UNLOADING PLANTS  
RAILROAD and MINE CAR  
DUMPERS

Knowing the specific requirements, Heyl & Patterson worked with the Coal Company's engineers on the installation of cleaning equipment adapted to the particular conditions so as to assure an efficient and completely integrated job.

To save time and to conserve materials, R. & P. provided the steel for the plant by dismantling an unused tipple. Heyl & Patterson fabricated and electrically welded this material on the site. The result is a substantial structure to house the cleaning operations.

This coordination of effort by the R. & P. organization and the engineers of Heyl & Patterson may contain a suggestion for other coal companies faced with similar losses and help them to obtain more coal from their mines to meet war-time requirements.

**HEYL & PATTERSON INC.**  
50 WATER STREET PITTSTURGH, PA.

placed on 9-in.x2-ft. 10 $\frac{1}{4}$ -in. concrete walls resting on 12x18-in. concrete footings. Redwood collar braces 3x10 in. and 4 ft. long were used between the beams, and the sections were lagged on the side and over the top with 3x12-in.x20-ft. redwood.

In the concrete as in the steel section, footings were placed with their tops on the subgrade. On these footings, walls were poured in 50-ft. sections 12 in. wide at the bottom, 8 in. at the top and 6 ft. 11 in. high. An 8-in.x11-ft. 9-in. slab also was poured in 50-ft. sections, with expansion joints at 50-ft. intervals in both walls and slab. Tunnel driving continued during this work, but it was necessary to shut down for two days while backfilling with the bulldozer, during

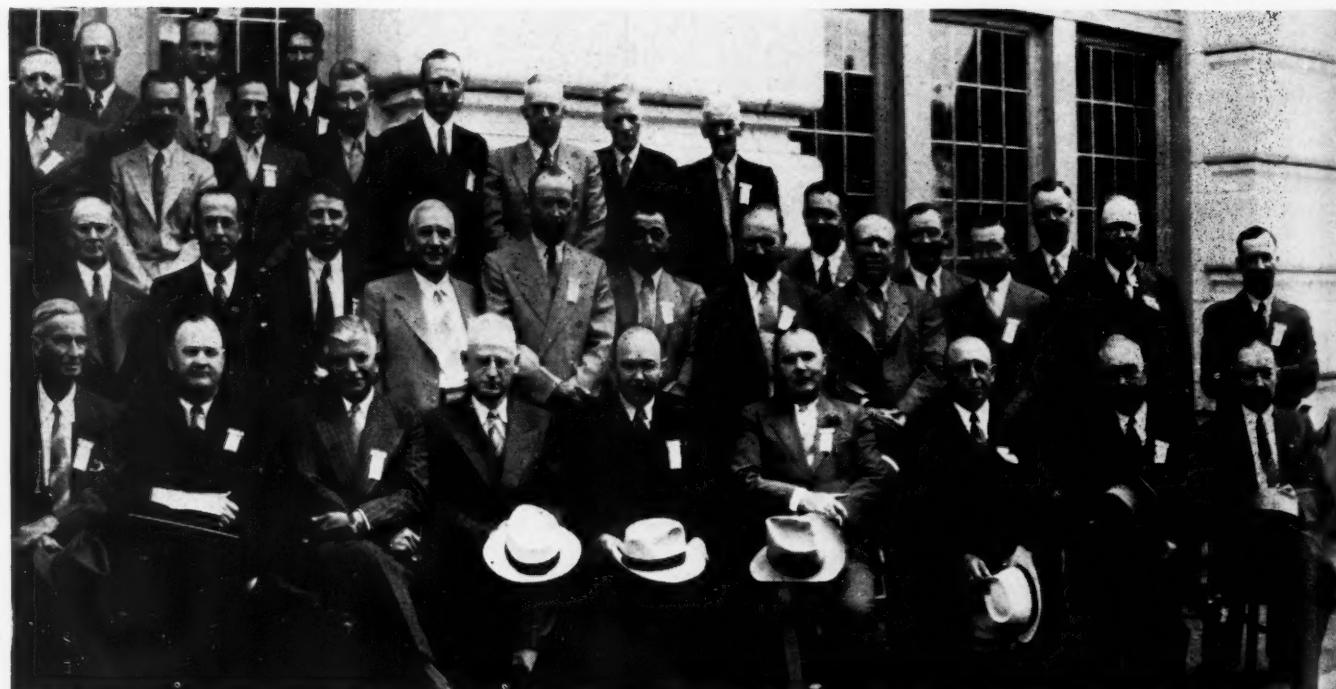
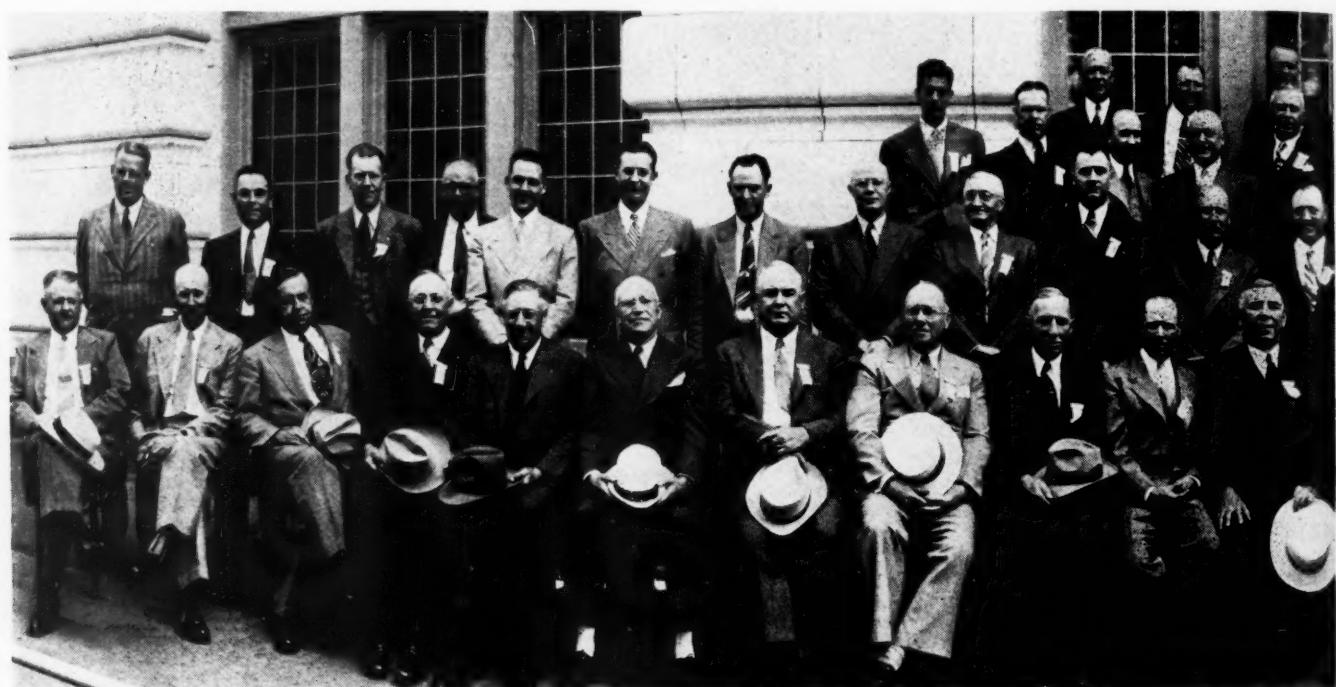
which the steel and concrete sections already in place were protected by center props and struts.

Straight tunnel driving was the order from 300 ft. to 2,071 ft. (0.7-percent grade), at which point the tunnel was widened to start at Y, one leg curving north and the other south to intersect the two seams which the tunnel was designed to serve. Soft ground at the beginning of the tunnel required little shooting. In this portion, pioneer wooden bars forepoled with lagging were set above the regular steel-timber level and later were used as packing. Some 50 ft. was driven by hand before the shaking conveyor was set. Five rock cars and a 4-ton trolley locomotive were used throughout the job. Permanent

75-lb. rail was laid on creosoted ties, with a spur to a waste pit.

The Goodman G-20 shaker was set on 14-ft. 10-in.x10-in. fir. Occasionally it was necessary to lay ties crosswise, skin to skin, underneath the planks. Loading was done with a duckbill. An average of 260 ft. was driven per move. Nineteen holes constituted a round in shooting the heading with 10-percent special gelatin. Two Gardner-Denver D-79 drifters with Timken bits were used on a horizontal bar, first set 2 ft. from the roof and then 2 ft. from the floor. Ribs and top were trimmed with an S-55 hammer and M-11 stoper.

After each move of the shaker, 6x12-in. concrete footings were poured on each side



Putting their best faces forward, institute members pose for the official photo, here split up for convenience in reproduction

# CONSERVE STEEL BY THOROUGH MACHINERY MAINTENANCE

**WHAT YOUR MACHINERY'S DEMAND IS:**  
**MAKE EVERY PIECE OF**  
**EQUIPMENT LAST LONGER**

(Reading Time: 38 seconds)

★ Get the most out of what you have—by thorough maintenance. Every extra hour of service you get from your wire rope saves just that much wear on the replacement rope. Give your ropes constant attention to reduce wear, abuse and replacement. When you inspect them, for instance, don't inspect for safety alone—inspect for good operating conditions. If excessive abrasion appears, it might have been caused by a point of rubbing or wrong fleet angle. Either may easily be corrected.

If your rope shows a concentration of broken wires in any one section, doubtless you can cut out a section of the end and pull your rope forward.... Or perhaps you can turn your rope end for end and have virtually a new rope to use.

Inspect for proper lubrication. Don't wait until your rope is dry to lubricate it. Lubricate your rope before it shows evidence of such need. A dry rope may be a ruined rope.

Get the recommendation of a Hazard wire rope man. Hazard **LAY-SET** **PREFORMED** resists bending fatigue, kinking and snarling. **LAY-SET** spools better, is faster and safer to handle, lasts longer.

Keep equipment in good condition. Make it last longer.

#### HAZARD WIRE ROPE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth,  
Los Angeles, New York, Philadelphia, Pittsburgh,  
San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, INC.  
BRIDGEPORT, CONNECTICUT

HAZARD **LAY-SET**

WIRE ROPE

*the swing is to*

# WHEAT

*The Engineered Cap Lamp*



12

## Reasons why

- 1 Two bulbs (one for emergencies) — miner is never in the dark.
- 2 Center mounted, Krypton-filled bulb, gives 20% more light — no dark "shadow spot" in beam.
- 3 Choice of 3 reflectors gives narrow concentrated beam, a medium beam, or a widespread beam of light — suits all working conditions.
- 4 Headpiece weighs less than 6 ounces, Lamp Cord 6 ounces, Battery 62 ounces — Total weight of Lamp complete 74 ounces.
- 5 Headpiece molded of strong bakelite; sealed, moisture-proof and dust-proof.
- 6 Rubber battery case — non-conductor of electricity — a valuable safety feature.

- 7 Battery solution (free) limited to one ounce total both cells.
- 8 Lead-acid type battery maintains high voltage throughout shift (80+% efficiency) — year after year.
- 9 Battery charged through headpiece and cord of cap lamp — a daily test of all connections.
- 10 Designed for self-service charging system for lowest lamp-house operating cost.
- 11 To charge, headpiece is simply slipped on to key in charging rack, and turned to make contact. Nothing to take apart — unit-sealed construction.
- 12 A payment plan (purchase or rental) to meet the requirements of companies — large and small.

**Note — More New Wheat Cap Lamps were installed in the U.S.A. during 1940-1941 than in any previous 2-year period**

*Write today*  
WHEAT LAMP SALES, INC.  
1501 Kanawha Valley Bldg., Charleston, W. Va.

SPECIALISTS IN MINE  
LIGHTING FOR 25 YEARS  
KOEHLER MFG. CO.  
Marlboro... Mass.



## These MESCO Products WILL HELP YOU WIN The BATTLE of PRODUCTION



**MESCO SECTION SWITCHES**  
Precision-built for safety and service. Blades easily interchangeable from right to left hand. All types and sizes, for use with any trolley wire and feeder cable combination.

WRITE FOR INFORMATION

**MOSEBACH ELECTRIC & SUPPLY COMPANY**  
1115 ARLINGTON AVE., PITTSBURGH, PA.



**FLASHWELD RAIL BONDS**  
Made by patented Flash-weld process, for low resistance, long bond life. Sixteen styles, to meet every bonding need.

of the tunnel to the new loading point and allowed to set at least two days. In the first 100 ft. of tunnel proper, the timbering consisted of 4x4-in.x6 ft. 10½-in. steel legs (13.8 lb.) and 10x5½-in.x12-ft. bars at 21 lb. set on 4-ft. centers. Collar braces were 3-in. 6-lb. channel. The tunnel was lagged solid with 3x12-in.x8-ft. redwood with the ends staggered. From 400 ft. inside the portal to the Y, the work was the same except that the sets were installed on 5-ft. centers and the lagging was 10 ft. long. Legs and bars at the Y were graduated in length and weight to fit the span, with triangular concrete blocks at the three corners of the pillar in the center of the Y.

Air was supplied by a 5,000-c.f.m. blower fan and tubing for the first stage of tunnel driving. Three 24-in. holes were drilled from the surface to the tunnel, the first 950 ft. from the portal or 650 ft. from the end of the open cut, which was left open until this hole was reached. The second hole was 550 ft. in by the first and the third 500 ft. in by the second. When the first hole was reached, the blower was moved to a point 35 ft. outby and a curtain was placed between hole and blower. A second 5,000-c.f.m. exhauster was installed over the drillhole on the surface. This system was followed with the other two holes.

Welding of cradles and cradle runners due to the wearing action of the sand was the largest single repair item. Very little wear was incurred by either the motor or drive. Tunnel crews, working three shifts a day, consisted of one unit foreman, three heading men and one loading-end man. The construction crew, working one shift, consisted of eight men.

Reporting on 3½ years of operation with belt slope haulage at the D. O. Clark mine of the Union Pacific Coal Co., Superior, Wyo. (Coal Age, November, 1938, p. 44), George A. Brown, superintendent, stated that the belts have given little trouble outside of that caused by carelessness.

### Belt Advantages Listed

Belts were chosen for slope service for several reasons, among them the high cost of building sufficient trackage for handling cars on the surface, as well as the handling difficulties growing out of severe winter conditions. Also, the conveyors insure uniform delivery of coal to the tipple without the power peaks incidental to hoisting cars. The system was set up to handle an estimated total of 7,000 tons per day. Maximum over to date has been 4,500 tons.

D. O. Clark mine was started in December, 1936, by driving a pair of rock slopes through the coal measures on a grade of approximately 17.5 percent. The slopes, 2,600 ft. long, extend to the deepest seam—No. 15. One slope is the beltway, with the other reserved for materials and men. Transportation on cross entries and slopes in the various seams is handled by locomotive and rope haulage.

Coal is produced from four seams, and is dumped onto the belt system at two stations, one in No. 7 seam and the other in No. 15, using gravity-operated rotary dumps discharging into 25-ton bins. Reciprocating feeders (four speeds) move the coal out onto the system, consisting of four belt units interlocked to prevent piling up in case one fails to start. Each belt is powered by a 125-

## Coming Meetings

• Joint meeting of Coal Division, A.I.M.E., and Fuels Division, A.S.M.E., Sept. 30-Oct. 2, St. Louis, Mo.

• Illinois Mineral Industries Conference, sponsored jointly by Illinois State Geological Survey, Engineering Experiment Station of University of Illinois and Illinois Mineral Industries Committee: Oct. 30 and 31, Urbana, Ill.

• National Safety Congress and Exposition: Oct. 2-4, Stevens Hotel, Chicago.

hp. totally inclosed 2,300-volt motor. Belt speed is 350 f.p.m. Rubber-disk idlers are used under the 6-ply 42-oz.-duck belts at the loading points to cushion impact.

Concluding this session was an arc-welding movie presented by Elwood Bachman, engineer, General Electric Co., followed by a picture on aluminum from mine to finished product.

Pointing to the need of a perspective view of the production and use of energy to facilitate better planning of production for the period following the war, V. F. Parry, supervising engineer, U. S. Bureau of Mines—Subbituminous and Lignite Section, presented a detailed study, accompanied by charts and graphs, of the trends in the use of energy in the western states with particular reference to coal.

Summarizing, in the ensuing discussion, that section of his paper covering hydrogenation, Mr. Parry stated that "hydrogenation will come into use because of the limited reserves of gas and oil. Motor fuel can be made from coal by heating a paste of oil and coal under pressure in contact with a catalyst. Petroleum has a ratio of carbon to hydrogen of about 0.6, but the ratio in coal is about 1.2. When hydrogen is added, the ratio approaches that of petroleum and the coal liquefies.

### Hydrogenation Cost 12 to 18c.

The estimated cost of hydrogenation is 12 to 18c. a gallon and the yield that may be expected from Utah coal is approximately 2 bbl. of gasoline per ton of coal, or the conversion is 40 to 45 percent. . . . Approximately 46 percent more energy than now used per capita would have to be produced to supply the requirements if the western states were forced to supply gasoline and gas from coal, and if coal displaced fuel oil directly, production of coal per capita in the West would increase approximately 500 percent. In other words, approximately 7.7 tons of equivalent coal would be required per capita, compared with 1.3 tons produced in 1939."

"Surface moisture on coal affects both the mechanics of preparation and marketing," declared Carl S. Westerberg, preparation engineer, Utah Fuel Co., in a discussion of this subject limited to coal 1 in. or less in size. Mr. Westerberg described "surface moisture" as the percentage weight loss in a sample of coal heated in moving air at 10 to 13 deg. C. above room temperature until the loss in weight is less than 0.1 percent per hour, and based his remarks on experience at three Utah Fuel properties.

"There are numerous factors affecting the

# "Back" and "Forth" Brownie ANNOUNCE THE NEW AUTOMATIC BROWN-FAYRO CAR SPOTTER

**Back:** Say, Forth, should we tell these readers of Coal Age that our new Car Spotter is especially designed for use where a single belt conveyor loads as much as 6 tons of coal a minute into mine cars?

**Forth:** Sure, but also explain that the Car Spotter moves the trip of cars by means of a barney operating in guides set between the rails.

**Back:** Under the control of the operator and the limit switch, this barney is pulled forward exactly one car length. Then it's reversed and pulled back one car length.

**Forth:** Exactly, and on the forward motion the barney catches a lug on the car and pulls the entire trip with it, stopping an empty car just under the conveyor discharge.

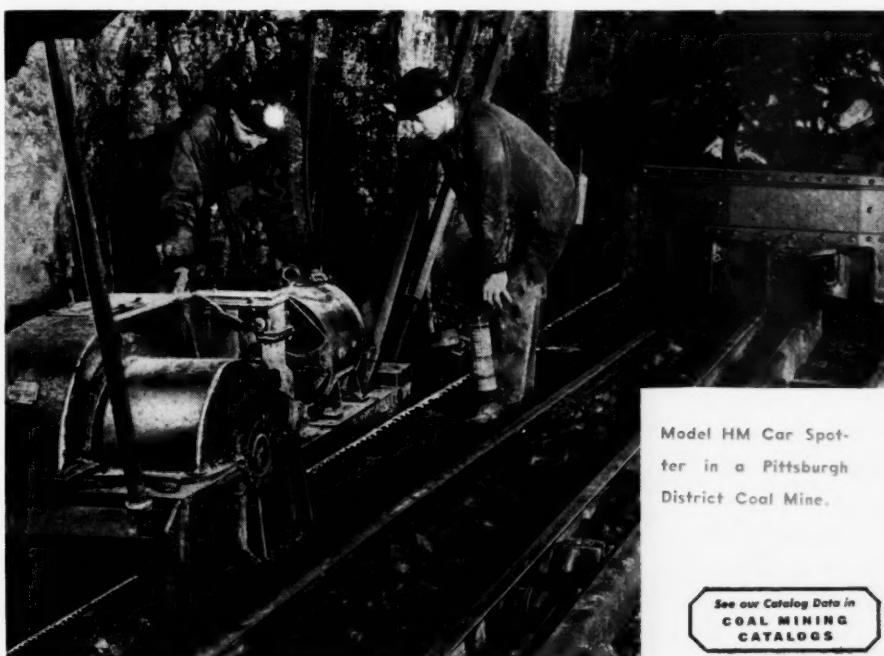
**Back:** Don't forget that keeps a constant supply of empty cars at the loading point—so that the conveyor can keep pouring the coal out without shutdowns to change ropes.

**Forth:** Yes, and how about power and speeds?

**Back:** Glad you asked. The Car Spotter is rated 12,000 lbs. rope pull and geared for a hauling speed of 40 ft. per minute and a return speed of 60 ft. per minute. A 15 HP motor is used.

**Forth:** A high speed car spotter means a lot to production these days, especially when it can be moved and installed quickly.

**Back:** That's it and the best thing to do is see one in operation.



Model HM Car Spotter in a Pittsburgh District Coal Mine.

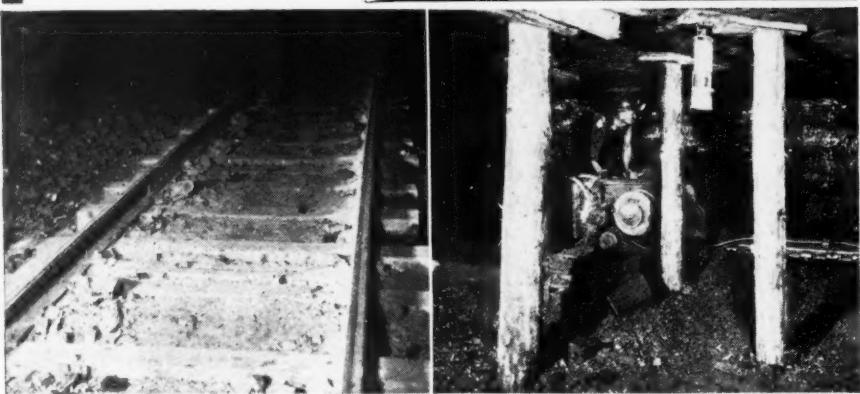
See our Catalog Data in  
COAL MINING CATALOGS

**Forth:** In a mine at work?

**Back:** Where else! Just drop a letter to Brown-Fayro and they'll make the arrangements and send complete data.

THE BROWN-FAYRO COMPANY  
JOHNSTOWN, PENNA.

# PHYSICALLY FIT FOR MORE YEARS OF SERVICE



(Left) Osmose-treated oak ties in haulage way of Clover Fork Coal Co. Mine, Kitts, Ky. (Right) Posts, caps, wedges Osmose-treated in Alabama Mine, give 3 to 5 times longer service.

## How Osmose-Treated Mine Ties and Timbers cut maintenance and replacement costs

Mining companies throughout the country are using Osmose-treated ties and timbers because they have a service life three to five times longer than untreated timbers thus cutting maintenance and replacement costs 300 to 500%. Easy to apply by dipping or brushing, Osmosalts penetrate into the wood forming a deep zone of protection that resists wood decay and prevents rot. Because Osmose-treated timbers keep their original strength, they provide additional safety by helping to prevent serious, costly accidents that often result from untreated decaying timbers. Our field engineers are available, for consultation on your wood-preserving problems. Ask for his services.

## OSMOSE WOOD PRESERVING COMPANY OF AMERICA INCORPORATED

General Offices: Buffalo, N. Y.—Branch Offices: Birmingham, Ala.; Denver, Colo.; Harlan, Ky.; Kenova, W. Va.

### Why OSMOSE PROTECTION PAYS

1. PERMITS the use of any species of fresh cut native timber locally obtained. Requires no waiting for seasoning.
2. PROVIDES 3 to 5 times longer service life over untreated timber because Osmosalts penetrate deeply into the wood.
3. ELIMINATES capital investment in treating equipment and also does away with transportation charges to and from pressure treating plants.
4. ENABLES you to treat your own timber with unskilled labor by simply brushing or dipping.

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DIRECT MAIL LIST SERVICE

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surface moisture of coal as it reaches the surface plant. Among them are: (1) quantity of mine water encountered at the face; (2) extent of sprinkling at the face and along the haulageways; (3) thickness of the seam, in that the thinner the seam the more moisture from whatever source will be caught and held by the increased ratio of fine coal from machine cuttings; (4) length of storage time in cars before dumping; (5) precipitation between mine portal and car dump."

Reporting on 45 samples of 1x0-in. slack from the raw production of Mine A, Mr. Westerberg stated that the average surface moisture was 3.0 percent, with the range as 2.2 to 8.3. To do a consistently good screening job at 1 in., it was found necessary to add enough screen plate to take care of coal up to 8 percent surface moisture, the area being approximately one-third greater than required for a coal with a surface moisture of 4 percent.

In the production of a raw  $\frac{3}{8}$  x 0 size from a 3x0-in. feed, using a 4x12-ft. vibrator, it has been found that with an even size distribution and feed the yield of  $\frac{3}{8}$  x 0 varies inversely with the moisture content. "In other words, a 3x0-in. coal, the 1x0-in. portion of which bears 8.3 percent surface moisture, will produce about half as much of the minus  $\frac{3}{8}$ -in. product as a 3x0 the 1x0-in. portion of which bears 5 percent surface moisture."

### Must Consider Moisture

If it was necessary to load an intermediate size, such as 1x $\frac{3}{8}$ , in addition to  $\frac{3}{8}$  x 0, "variations in surface moisture would result in an uneven product bearing, according to actual tests, from 4 to 17 percent of undersize material in the nominally 1x $\frac{3}{8}$  product. The practical importance of this is that if for any reason it were necessary to prepare a well-screened intermediate size from the mine-run coal in the minus 1-in. range it would be necessary to take into account the variations in surface moisture likely to be encountered. There are obviously two ways of doing this without varying the feed to the screen. One is to install screening capacity sufficient to do a good job on the highest surface moisture encountered. The other is to work out a heat-drying arrangement for drying the 1x0-in. coal."

At Mine B, where a similar minus  $\frac{3}{8}$  product is loaded, using a trommel screen, "coal originating in wet dip workings, though the size distribution is the same as from dryer rooms and raise workings, yields only one-third to one-half as much  $\frac{3}{8}$  x 0."

Another screening problem which depends upon surface moisture "sometimes is overlooked by equipment manufacturers and operators alike. When wet-washed coal is crushed to sizes below 1 in., it is assumed that the crushed product will have the same surface moisture as the uncrushed coal. In practice, it seldom works out this way because drip which travels along the conveyor with the wet-washed coal gets into the crusher with the coal and is picked up by the increased dry surface area of the crushed coal. . . . Unless arrangements are made to drain off the water which travels in conveyors and chutes it can result in a 2- to 3-percent increase in surface moisture of the crushed coal over that of the feed to the crusher. Another point sometimes overlooked is that a larger part of the surface moisture

of the crushed coal is concentrated in the fines."

Coal buyers have only recently begun to appreciate the importance of total moisture in coal. As a result producers are beginning to appreciate it, although they can control only the surface portion. "It has been the experience of the Utah Fuel Co. that commercial accounts object to high moisture more because of handling difficulties than because of lower heat values. The objections have been that on occasion in severe weather slack coal is received in a semi-frozen condition and again because high moisture in certain sizes of the coal results in overloading the heat-drying equipment preceding a pulverizing unit. These difficulties always are attributed to improper drying in the case of washed coal or to loading wet coal in the case of raw coal. Actually, many of the complaints in cold weather can be traced to precipitation en route. Precipitation during non-freezing weather does not greatly affect the coal delivered unless there is a heavy rainfall just prior to unloading. . . .

"It is plain that as more importance is attached to moisture of coal, the producer cannot ignore the problem without jeopardizing his market. The obvious approach is to find out the market requirements, then arrange to meet them. As for designing preparation facilities, it is important to acknowledge and provide for extreme variations in surface moisture."

#### Output Over Half Slack

Reporting on tests to determine the size consist and properties of 2½-in. subbituminous slack from the northern Colorado field, permitting also calculation of the probable heating value, ash and moisture content of sizes prepared from fresh-mined coal of this character, Messrs. Parry and W. S. Landers, assistant chemical engineer, Golden (Colo.) field office, U. S. Bureau of Mines, pointed out that approximately 1,250,000 tons of 2½ and 1½-in. slack, representing over half the output of 40 to 50 mines, is produced annually in the Denver region.

"This represents the total slack produced by mining and crushing. Part is rescreened to make pea and modified pea sizes measuring 1½x2½ and ¾x1½ in., round hole. About 900,000 tons of ¾-, 1½- and 2½-in. slack is consumed annually by industrial plants.

"Certain factors affect the utilization of 2½-in. slack in the Denver region," one of which is increasing hydro power. If more hydro power is produced, the trend in slack consumption might be downward unless industrial activity offsets this increased water output. "The rapid increase in domestic stokers during recent years has required the preparation of greater quantities of stoker coal, resulting in more crushing of lump and changed preparation facilities." Crushing at present accounts for about 19 percent of the coal produced. "The trend toward the use of clean and smaller sizes for domestic stokers results in slack having a greater amount of fines. In the future, even greater quantities of small stoker coal probably will be prepared and the resulting increased quantities of small slack will have to be used for industrial purposes."

Assuming that the increase in crushing continues, "2½-in. slack available in 1948 will represent 74 percent of all the coal mined in the field, or about 1,750,000 tons

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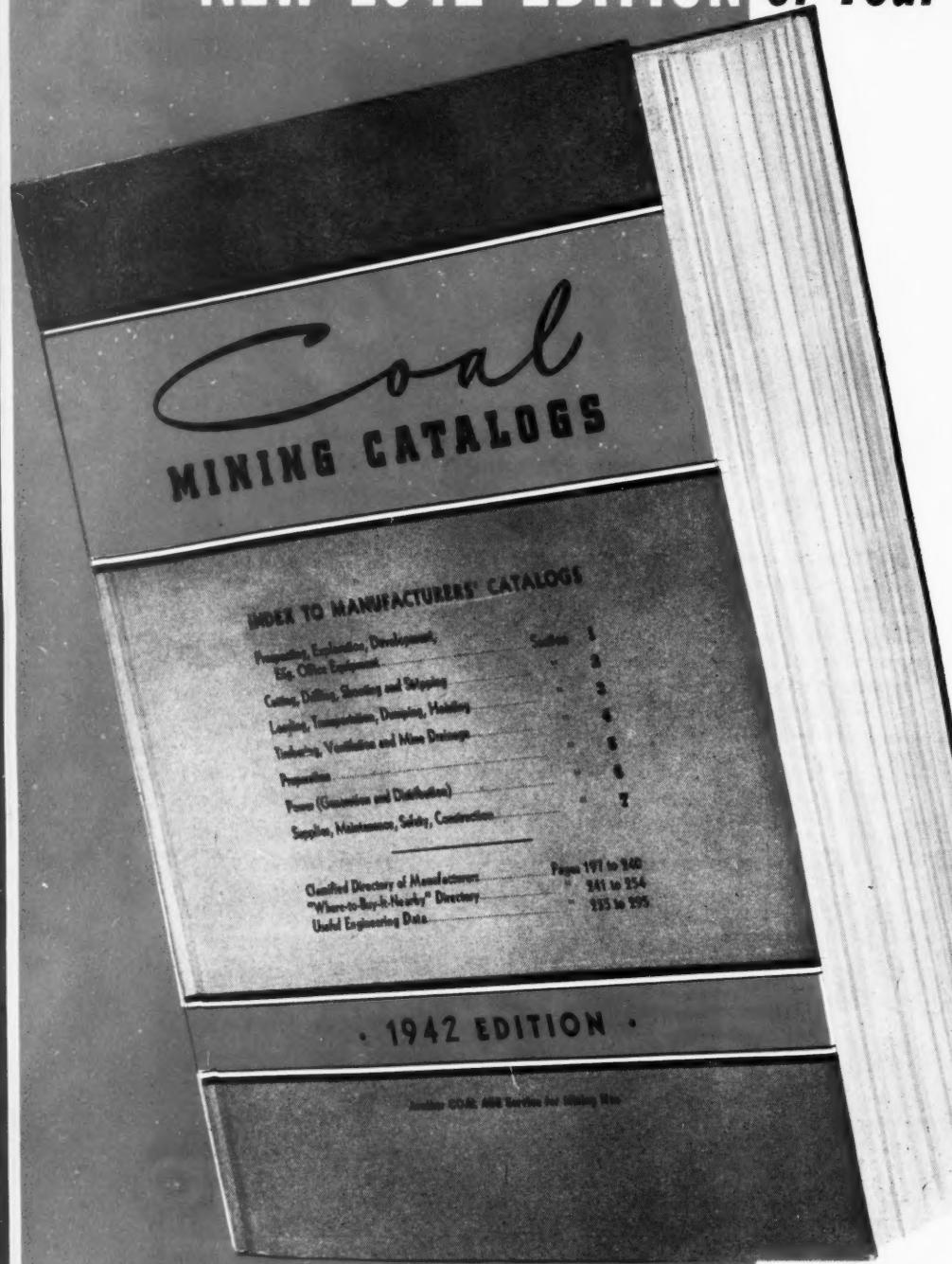
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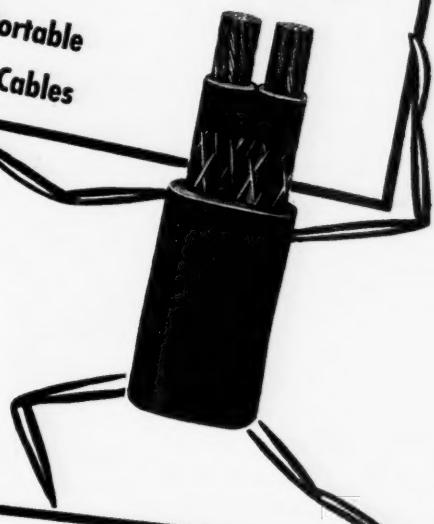
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a year," assuming no change in the annual output, which has been steady for 20 years. "The use of 2½-in. slack for industrial purposes is assumed to increase and by 1948 may represent 47 percent of the total sales. The difference between this percentage and the total percentage of 2½-in. slack represents the portion of total production which will be available for rescreening to prepare the various small sizes for use in automatic tokers."

Application of the size-consist data indicates that "13 percent of the total coal purchased in 1948 might be stoker sizes produced between 1½- and 1½-in. screens. If that proves to be so, approximately 2½ percent of the total coal produced will be 0x½-in. dust. Likewise, if stoker coal is screened between ½- and 1-in. screens, about 7 percent of the total production will be represented by this size. . . .

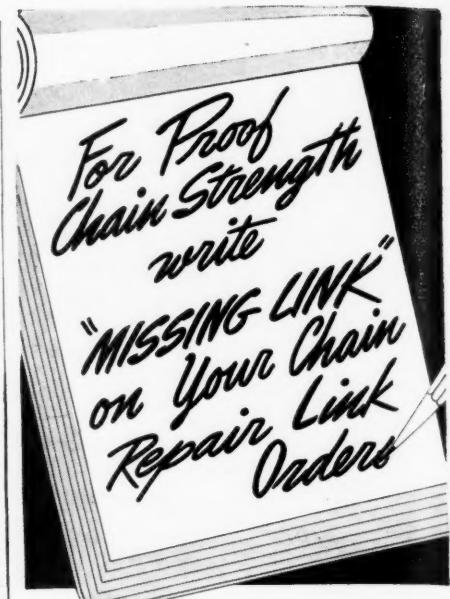
"The economic importance of the disposition of slack is obvious. The quantity and price of slack are increasing, but the average sales realization from slack sold as such still is less than the average cost of production. Mine realization to meet production costs now is made up by sales of lump and prepared sizes at higher prices. As the demand for lump decreases, a larger economic burden will be placed on the prepared sizes. In order to meet this requirement, the market for these prepared sizes must be expanded. This in turn requires knowledge of three things: (1) the yields of definite sizes which can be expected from the screening of slack; (2) the physical and chemical properties of these sizes; (3) equipment and processes for the efficient and attractive utilization of these sizes.

#### Stoker Performance the Test

"The performance of non-caking coals in domestic stokers is one of the most important phases of this program. Studies made by the Bureau of Mines at Golden, Colo., indicate that careful preparation of coal is necessary to improve performance in stokers. The trouble-causing dusts and degradation in the stoker can be minimized by proper sizing. We have observed that the  $\frac{1}{8}$ -in. size, square hole, is the best for subbituminous coal in stokers."

Mines in the Carbon County coal field of Utah, plus the towns of Price and Helper and other smaller communities, constitute a 12,000-kw. load, said J. A. Hale, vice president, pinch-hitting for George M. Gadsby, president, Utah Power & Light Co. "Actual consumption at the mines since 1930 has run between 7 and 9 kw-hr. per ton of coal. Strange to say, since 1930, it has not been increasing. And that ratio, if it has been increasing, is at a very small rate. In 1940, it was 8.79 kw-hr. per ton and in 1941, 8.2, despite additional mechanization and the fact that there are now some washing plants that use a large amount of power for a refinement that was not considered possible until just a few years ago.

"I think the explanation for this constant ratio is the fact that there has been a continual effort to use power more economically in the mine. . . . The pertinent fact about the power load in the Carbon County coal field is that it is growing. The reason, of course, is obvious — not because of an increase in power per unit of coal mined but because the tonnage is increasing." With

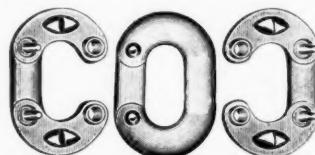


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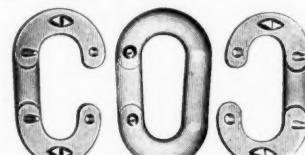
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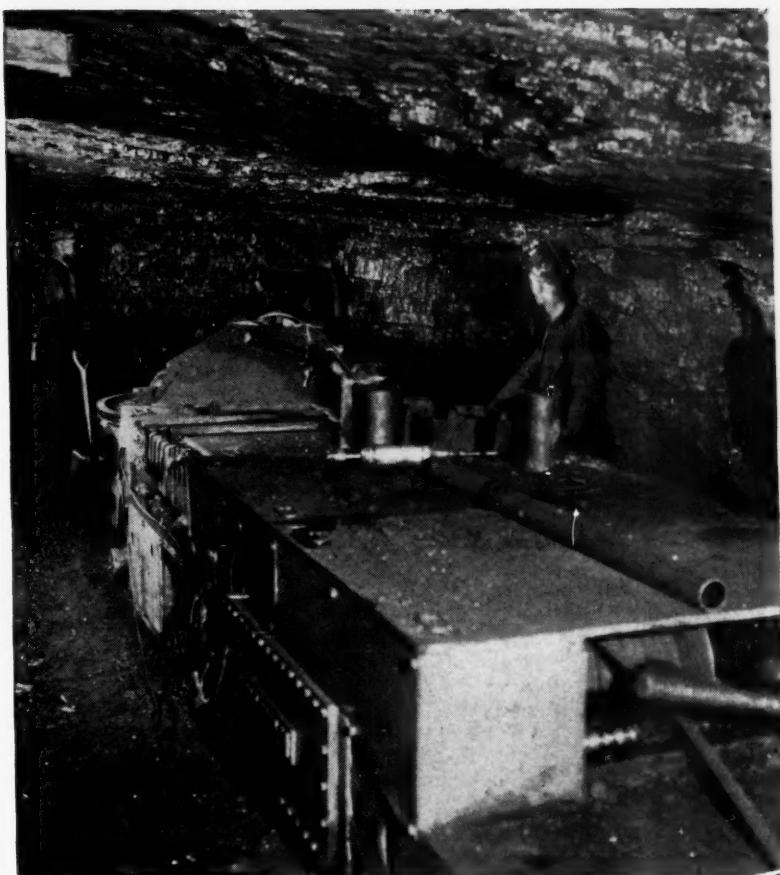
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With this in mind, steps are being taken to handle the increases as they occur. This is in line with the policy of the utility industry in general, which has increased its capacity and rearranged its facilities to take care of all expected demands in 1942 and 1943, involving a national increase in generating capacity of 27½ percent from 1939 to the end of 1943.

Better mine power, declared D. E. Renshaw, industry engineering department, Westinghouse Electric & Mfg. Co., in an analysis of the use of modern methods and equipment to that end, "means (1) a power supply that is free of all preventable interruptions; (2) a power supply of adequate capacity; (3) normal voltage at the terminals of every motor; (4) efficient conversion and distribution of power.

"Most mine power is generated by public-utility systems and these do an excellent job of providing continuous service. To maintain equally good service on the mine-distribution system, protection must be provided against that most unpredictable and destructive of the elements—lightning. Modern lightning protection for machines connected directly to the exposed overhead lines consists of a lightning arrester and a capacitor connected as shown in Fig. 1.

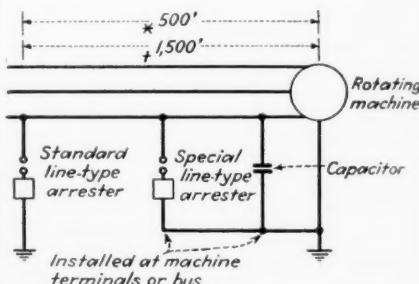
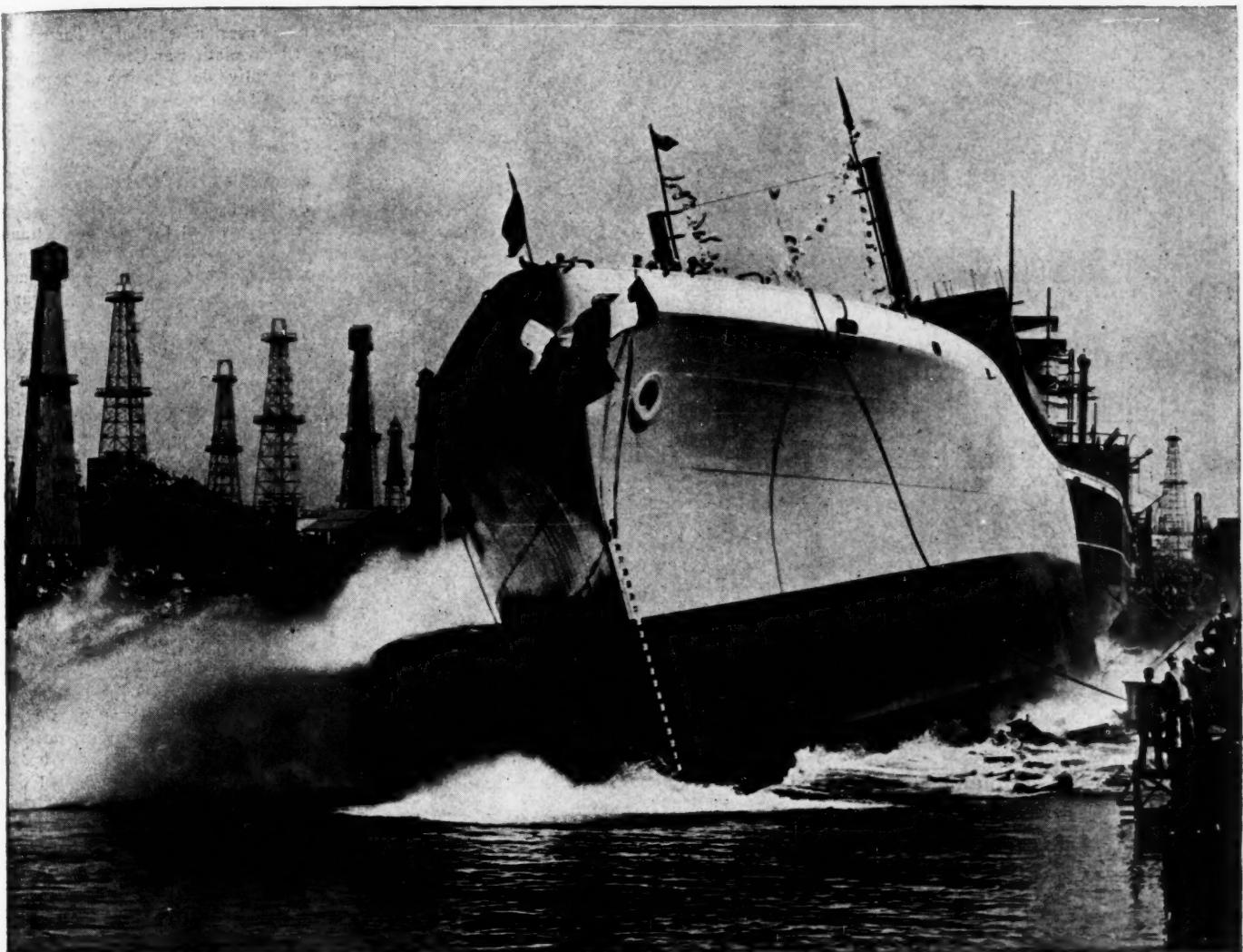


Fig. 1—Lightning protection for rotating machines.

"The arrester acts as a safety valve to reduce the voltage of the lightning surge to a value that the motor insulation can stand and the capacitor acts as a throttle to retard the surge so that it distributes itself over the motor windings instead of concentrating the stress on that part of the winding adjacent to the incoming leads. These protective devices provide entirely adequate protection against any but severe direct lightning strokes, for which no positive protective means are yet available.

"To obtain satisfactory performance from an a.c. motor, the voltage at the motor terminals must be very close to normal because, at low voltage, the motor will not pull the load and, at high voltage, the motor will overheat, even at light load. To maintain normal voltage on a low-voltage distribution system, the length of the lines must be relatively short." Therefore, the step-down transformers must be close to the load centers.

"For underground operations, it is equally essential that the low-voltage lines be short because mining machines are subjected to frequent severe overloads and such overloads will stall the machines unless the voltage is good." Approved fireproof transformers which do not require specially prepared locations with vaults or oil pits, making them



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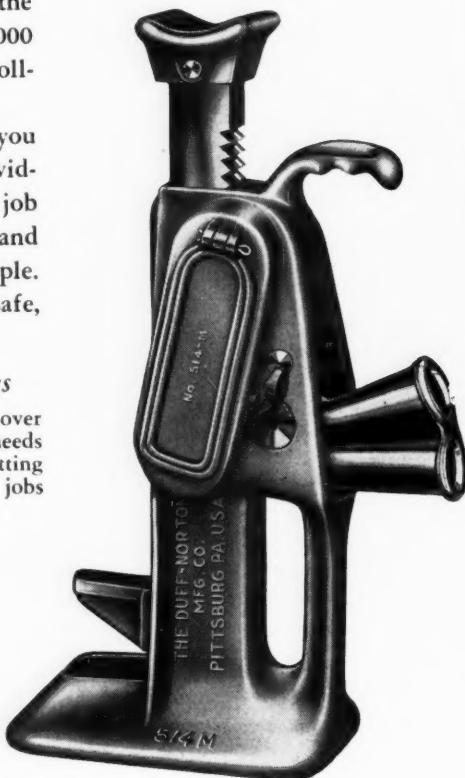
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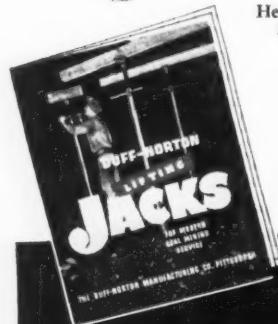
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easy to move, are available for underground service.

One type uses a synthetic flameproof liquid as the insulating and cooling medium. A more recently developed and approved flameproof unit is a self-ventilated air-cooled transformer containing neither oil nor any other liquid. "Insulation is composed of asbestos, mica, porcelain and other materials which will not deteriorate at high temperatures nor support combustion. Experience in service has shown that this air-cooled transformer can be used underground with complete success wherever open motors and generators can be used. Either type of transformer can be mounted on wheels to run on mine tracks or on skids for easy movement as the area of operations changes. . . .

"For the user, the air-cooled transformer offers several advantages, particularly for underground service. It is (1) lighter and generally occupies less floor space; (2) under no conditions will toxic or irritating gases be given off; (3) the air-cooled transformer has high short-time overload capacity; (4) the elimination of liquid does away with periodic reconditioning of the liquid and inspection and renewal of gaskets and fittings."

#### Good Power-Factor Vital

Low power factor in some areas involves a penalty. In addition, it results in unnecessary loading of transformers and distribution lines. "For example, a transformer rated at 100 kva. can carry approximately 91 hp. of motors at 80-percent power factor, but this same transformer can carry approximately 114 hp. at 100-percent power factor. This immediately suggests that it may be possible to relieve an overloaded system by installing capacitors to improve the power factor and thereby: (1) improve the voltage at the motor terminals; (2) reduce the power bill; (3) avoid the addition of more transformers; (4) avoid the construction of new distribution lines.

"D.c. power usually is obtained by converting a.c. by means of motor generators, rotary converters or the Ignitron-type mercury-arc rectifier. . . . If the a.c. power supply is properly protected, almost all d.c. power interruptions are the results of operating overloads or short circuits. Short circuits are caused by roof falls, wrecks, improper operation of mining machinery, etc. . . . Overloads occur because the many men operating machines have no way of knowing what loads are being imposed on the system. But, since these overloads usually are of short duration, they need not cause an interruption of operation if conversion equipment is provided which can carry the overloads for these short periods.

"This can be accomplished most readily by the use of the Ignitron rectifier. The Ignitron rectifiers which have been most commonly applied in all types of mining service are capable of carrying three times normal rated load for short periods. Compared to this, mining types of motor generators and rotary converters have a momentary overload rating of two times rated load. Our experience with coal mines operating some 20 Ignitron rectifier substations has shown that normal operating overloads do not cause power interruptions and stoppage of work. . . .

"To obtain proper voltage at the working places, the conversion substations must be

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brought electrically close to the work by means of large copper feeders, or the substations must be brought geographically close to the work. At this time, large amounts of copper either cannot be obtained or can be obtained only by taking copper that is badly needed elsewhere. Even where copper is easily obtained, it is a questionable economy to transmit low-voltage power over long distances. However, if substations are placed underground, they easily can be kept near the load center," especially if made portable.

Comparing efficiencies and losses (Fig. 2), the Ignitron rectifier is much more efficient than the motor generator. Under usual mine loads, a 300-kw. Ignitron will save up to 140,000 kw.-hr. per year. As compared with converters, the differences are small and the saving with a 300-kw. set probably is not more than 20,000 kw.-hr. per year. As the

assures greater continuity of service because it can carry extremely high peak loads."

Preparations were made, equipment was purchased and the operation was changed over from hand loading and animal haulage to a completely mechanized property in early May, 1939, said W. D. Bryson, manager of mines, Utah Fuel Co., in a paper on mining with track-mounted loading machines at Clear Creek, Utah, read by Wm. Moorhead. "A rotary dump was installed, along with power cables and motor-generator sets, trolley wire, etc., and, at first, one Sullivan 7.5 AU cutting machine equipped with a CD-14 drill, one Goodman 360 track loader and 100 164-cu.ft. mine cars. For haulage, two Goodman 8-ton cable-reel locomotives were used for gathering. Another unit, consisting of a cutting machine, a loading machine and two more gathering motors, was purchased, as well as 30 more mine cars."

Experience indicated that it was best, because of a soft top, to cut near the roof and leave coal, which also permitted leaving most of the bony shale band up with this remaining top coal. "The soft bottom and favorable grades indicated track-mounted loading machines. A further advantage of track-mounted machines in this case was increased mobility of loading units. By having the cutting machine, loader and gathering locomotives operate on d.c., the necessity of an extra power line to the face was eliminated. Simplicity of operation due to efficient power supply has been a contributing factor in smooth operation."

The seam is nearly flat, the pitch averaging 3 percent, except for numerous sharp rolls that go as high as 5 percent. Coal thickness varies from 6 to 7½ ft., and the seam is accompanied by a soft bottom and soft shale top, of which 6 to 18 in. comes down when all the coal is taken. Rooms are turned off the panel entries at a 60-deg. angle and are driven 22 ft. wide on 60-ft. centers. Pillar coal now constitutes about 60 percent of the total. Room depth is 350 ft., with switches in nearly all crosscuts to facilitate car-changing. Two locomotives serve each loader, with one at times taking cars to the parting.

### Average 10.2 Tons Per Man

A crew is made up of one faceboss, three machinemen, loader operator, helper, face-man, two motormen, two nippers, four trackmen, shotfirer, timberman, helper, one-half a repairman and one-half a dummyman, or a total of 19. With such crews, about 20 tons per man-shift to the parting is the regular figure. In the three years and four months preceding the changeover, output per man employed inside and outside up to the superintendent was 5.4 tons per shift. From mid-September, 1939, to May 1, 1942, the average was 10.2 tons. Cost, labor, supplies and power in the latter period, including the higher wages of the past year, was 54 percent of that in the previous period. Average tons per machine-shift over the entire period was 414.30, with the peak as 530.

"It appears that Utah's coal production, under the plans and developments now under way, will, conservatively, show an increase of 2½ million tons over the present-day production," stated B. P. Manley, executive secretary, Utah Coal Producers' Association, in analysis of some of the problems facing the State industry under war-time conditions.

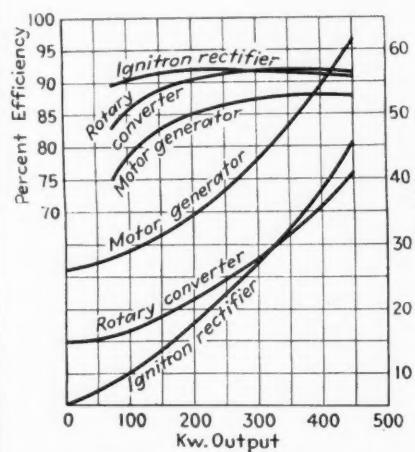


Fig. 2—Efficiency and loss curves for the motor-generator, rotary converter and Ignitron rectifier.

Ignitron efficiency is inherently higher at higher voltages, the Ignitron will save up to 180,000 kw.-hr. per year in 550-volt service, as compared with the motor generator, and up to 60,000 kw.-hr. in comparison with converters. Also, much less time is required in routine maintenance and cleaning.

"I would not give the impression that all the advantages always are favorable to the Ignitron. A fair summary of the merits of the three types will show that: (1) the synchronous motor-generator set can be used to correct power factor; (2) the d.c. voltage of the motor generator is constant, while the voltage of the converter and rectifier vary slightly as the a.c. line voltage changes; (3) the maintenance expense of the Ignitron is lower than for either type of rotating machine;

"(4) the cost of maintaining motor-generator sets and converters is more or less equal; (5) the rectifier can carry high overloads and can withstand short circuits without any damage, whereas commutators always are damaged a little or much by such conditions; (6) at 275 volts the rectifier is a little more efficient than the converter and much more efficient than the motor generator; at 550 volts, the rectifier is still more efficient while the efficiencies of rotating machines are not improved; (7) the rectifier, being a static device without vibration, can be placed in light foundations and requires no leveling or lining up; (8) the rectifier

# "Without an overhaul job since October, 1938."

*—from letter dated January 19, 1942*

**WHEN SHANAHAN BROTHERS,** Railroad and General Contractors, say that a shovel "has been subjected to extremely difficult work," it means something.

Yet this one has been used in their Quarry at West Riverside, California, since October 1938 "without an overhaul job of any nature."

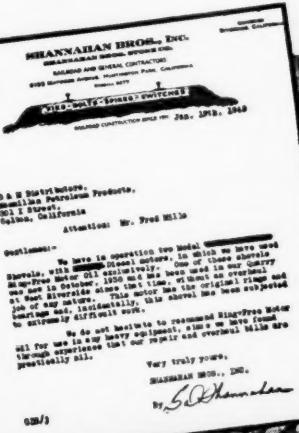
Shanahan shovels use Macmillan RING-FREE exclusively!

The motor shown "has the original rings and bearings," they write us.

And read why they say they do not hesitate to recommend RING-FREE "for use in any heavy equipment." It's because:

"We have found through experience that our repair and overhaul bills are practically nil."

What RING-FREE has done for others, it can do for you. Write us!

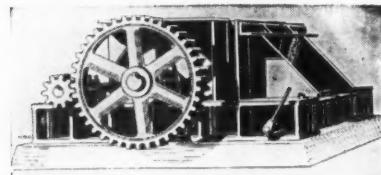


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## A NEW VERSION OF AN OLD TYPE



### "PENNSYLVANIA" TYPE "K" SINGLE ROLL COAL CRUSHER

With this advanced design, in rugged STEELBUILT construction, far more accurate sizing is possible to meet Code requirements through quick adjustability, in a range from  $\frac{3}{4}$ " to 8".

Further—real protection is provided by improved Safety Toggle Equipment, which quickly passes Tramp Iron, and instantly returns Breakerplate to crushing position.

Seven (7) sizes afford a capacity range from 50 to 1,000 tons per hour.

Send for Bulletin No. 2006.

Also— "PENNSYLVANIA"  
BRADFORD BREAKERS, BRADMILLS,  
GRANULATORS, HAMMERMILLS  
PUT YOUR COAL PREPARATION PROBLEMS  
UP TO US.



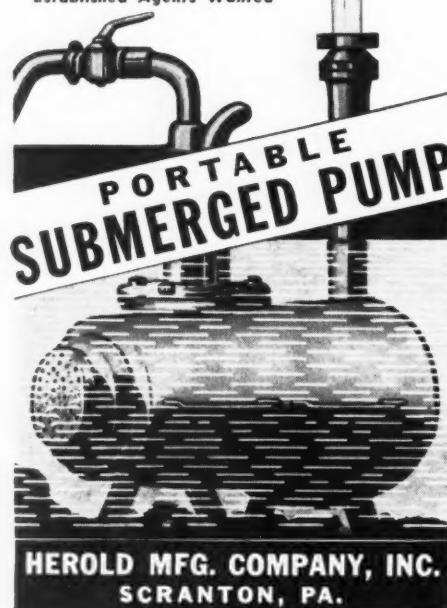
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Representatives in Principal Centers.

## HEROLD

Portable Submerged Pumps are patented and fully automatic with these performance features:

- Horizontal drum minimizing cost to excavate sump, no rotating parts, long life.
- No lubrication, low air consumption, not easily affected by abrasive material such as mud, silt, etc.
- High lift capacity. Write for data today.

Established Agents Wanted



This increase, however, will require a number of men equal to about the number now employed, presenting one of the State's biggest problems.

While the Selective Service has issued a list of "critical occupations" for the guidance of local boards, the problem still is acute. As a result, the matter is being explored with the State Selective Service Administrator and his aids as a prerequisite to finding the correct way of applying the standards. Another acute question is getting the men to the mines. Accordingly a survey of State bus reserves has been made, and a possible step is the use of school buses, although this might require adjusting school or shift hours, whichever was most appropriate.

Promotion of coal storage is another present-day task, said Mr. Manley, stating further that "in so far as Utah is concerned it worked out remarkably well." Both the R.F.C. and the banks made provisions for financing such storage, and the operators successfully converted their merchandising plan based on automatic coal firing to promotion of storage and how it would help the

war effort, although it involved reassuring consumers on the hazards of stocking. The cutting off of spray oil is a serious handicap, although efforts are being made to secure a modification of this ruling.

Utah tonnage in the first five months of 1942, said Mr. Manley, is 59.6 percent ahead of the same period in 1941 and 113.77 percent ahead of the first five months of 1938. Working days in the period in question were 99.06 in 1942, 70.64 in 1941 and 57.54 in 1938.

[EDITORS' NOTE—*Coal Age* regrets that lack of copies has prevented a report on "King-Mine Transportation," by C. M. McConnell, general superintendent, United States Fuel Co., and the "Trend of Accident Frequency and Severity Rates in Utah Coal Mines," by Henry J. Finch, attorney, Utah Fuel Co. At the same time, it gratefully acknowledges the assistance of Fred W. Whiteside, institute secretary, in supplying a transcript of the meeting and available copies of papers, which made this report possible.]

## Safety, Stripping and Materials Problems Feature Illinois Institute Program

### The "Mystery" in Mine Fatalities—Stripping in Fulton County— Spraying of Undercuts to Allay Dust—Priorities in Equipment and Supplies, as Analyzed on Boat Trip.

WITH ACCENT on the fact that this is its golden jubilee year, the Illinois Mining Institute analyzed safety, stripping, dust suppression at the face, the development of priorities and definitions of "maintenance" and "repair" in the course of its 24th summer meeting and boat trip on the Str. "Golden Eagle," June 5-7. Welcoming members and guests, President J. A. Jefferis noted that the silver anniversary of the boat trips would be celebrated in 1943.

Announcing that two men were being sought for University of Illinois scholarships offered by the Peabody Coal Co., Prof. Harold L. Walker, of the university's mining department, reported that Student Marion B. Walls, holding an Illinois Mining Institute scholarship, was making a better-than-average record. This IMI scholarship was extended another year.

The work of the State Council of Defense in helping business men produce war goods and at the same time prepare for necessary post-war adjustments was outlined by Dean Charles M. Thompson, on leave from the University of Illinois. The institute is one of six organizations helping in this program.

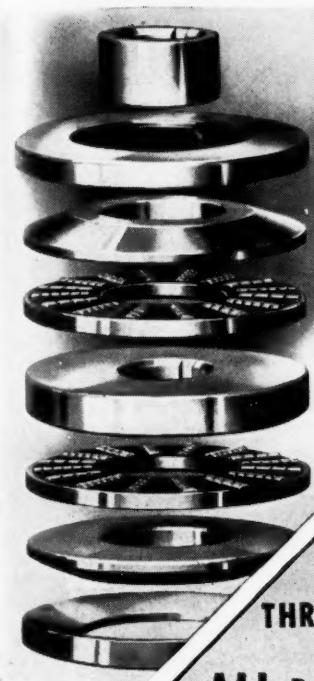
"There are no safe periods in mine operation," declared John Marchesi, Illinois State mine inspector, in an address on safety problems. A paragraph is being added to all letters of the Department of Mines and Minerals making the following point: "Don't overlook the fact that this is the most dangerous time of the year. A close check should be made of the ventilating apparatus, overcasts and doors to insure their being in good order at all times. Seals of worked-out areas should be inspected daily and as much oftener as necessary."

Output from Illinois shipping mines increased 4,961,513 tons to 51,033,319 in 1941. Number of mines rose 4 to 143; employment increased 972 men to 30,258. Local mines declined 31 to 723; employees 1,404 to 7,329 and output 878,280 tons to 4,332,516. Fatalities in 1941 totaled 92, an increase of 9. Non-fatal injuries were 2,096, or almost the same as in 1940. Thus, while production rose 10.75 percent, fatalities in 1941 increased 11.08 percent. For shipping mines alone, however, the increase in fatalities ran behind the tonnage rise, or 10.93 against 11.1 percent.

An increase in fatalities among superintendents and foremen (four in 1941 against two in 1940) was stressed by Mr. Marchesi. "Are the facts connected with accidents mysteries?" he asked. "From year to year, the deaths from falls of rock and coal at the face are 45 to 50 percent of the total. Haulage deaths are 20 to 25 percent. Are these mysteries that are not solvable?"

"Fulton County has progressed by leaps and bounds as a coal-producing area recovering Nos. 5 and 6 veins in the past ten years," declared L. G. Shorthouse, superintendent, Buckheart No. 17 mine, United Electric Coal Cos., in an address on stripping. "This county was abandoned by shaft operators because of lack of a good cap rock topped by a consistently firm shale." Some thousands of acres of coal with less than 60 ft. of cover were left for stripping. "A second factor—inhertently poor quality—limited the amount of coal that could be sold." From 1920 to 1933, production declined to less than half of the original total of 2,000,000 tons.

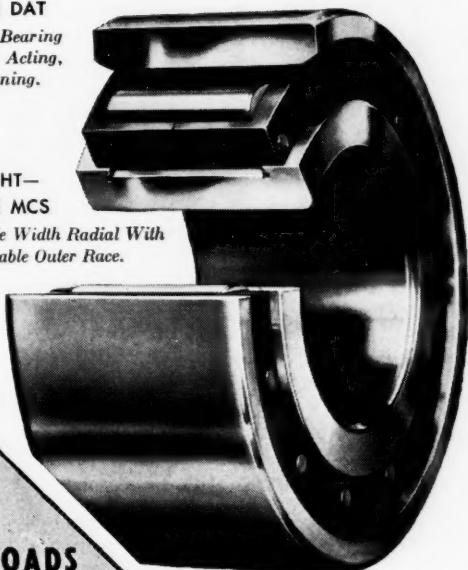
Stripping was begun at Cuba by United



LEFT—  
TYPE DAT  
*Thrust Bearing  
Double Acting,  
Aligning.*

RIGHT—  
TYPE MCS  
*Double Width Radial With  
Separable Outer Race.*

ALL  
THRUST LOADS  
AND  
ALL RADIAL LOADS  
carried at right  
angles to the  
ROLLER AXIS



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Under the  
**168-Hour  
Week**

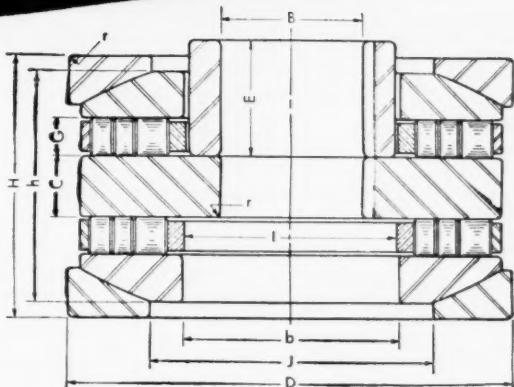
When You Load them the  
**Right-Angled  
Way!**

# ROLLWAY

When loads are heavy, when speeds are high, and continuous operation for 12 to 24 hours is the usual run, the wise designer and maintenance man changes his bearings over to Rollway heavy-duty bearings with solid cylindrical rollers. Bearings that carry thrust and radial loads *separately*, at right angles to the roller axis.

That means the elimination of destructive oblique loads with their resultant forces that cannot adequately be designed for. It means the engineering in *thrust bearings* of factors of safety, life expectancy, vibration-and-shock capacity, and low starting torque equivalent to that which you ordinarily get in radial bearings. It means a stronger bearing in a given dimension, with all loads uniformly distributed, all races parallel to the roller axis, no wedging of rollers against the radius of the race.

Above all, it means less wear, less service attention, and less down-time for the machine—factors that are vital in the 168-Hour week.



The DAT double-acting aligning thrust bearing handles severe misalignment and heavy thrust loads in either direction.

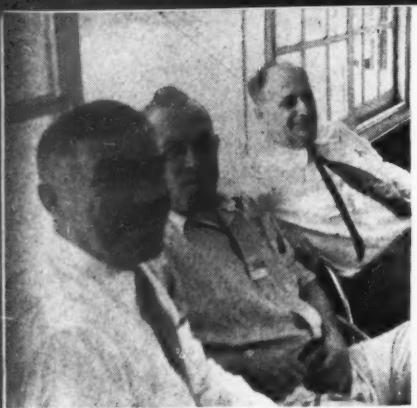
## STANDARD SIZES FOR MOST APPLICATIONS

No single type of bearing will prove adequate for all kinds of industrial applications. But Rollway's unusually wide range of sizes and types provides standard metric dimensions and tolerances for practically every requirement. Thus you get new bearings and replacements quickly and at economical prices. Send us your design for free bearing analysis and "engineered to the job" recommendations.

BEARING COMPANY, INC., SYRACUSE, N. Y.

**BEARINGS**

BUILDING HEAVY-DUTY BEARINGS SINCE 1908



Howard Lewis, Old Ben; G. M. Glidden, E. D. Bullard Co.; and John Foster, C. W. & F., enjoy a visit.



J. A. Jefferis, I.M.I. president, opens jubilee meeting.



D. H. Davis, Pittsburgh Coal Co., talks on dust control.



John Marchesi, Illinois mine inspector, discusses safety.



C. S. DeWitt, C. W. & F., looks for the birdie.



Ed Johnson, Jeffrey, and Roy Adams, Old Ben, stop for the Coal Age cameraman.



Harry Treadwell, C. W. & F., and Carl Hayden, Sahara, consider a knotty problem.



Dean Thompson, University of Illinois, gets ready to relax.



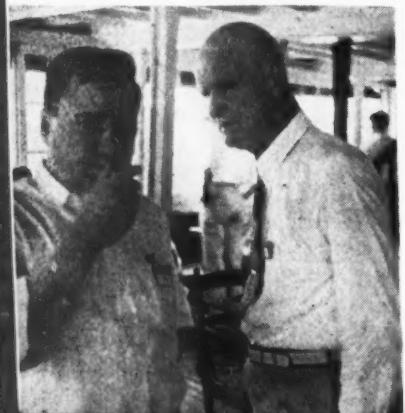
Joe Vlasak, St. Louis & O'Fallon, smokes a peaceful pipe.



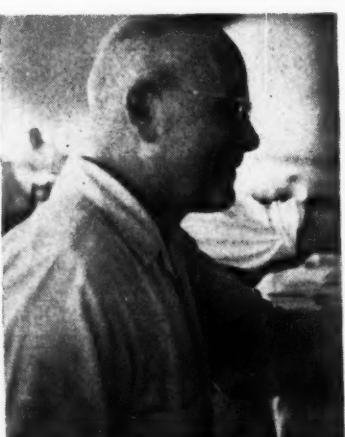
Norman Prudent, Crescent, peeks around Prof. Walker, U. of I.



A. E. Pickard without that red necktie for a change.



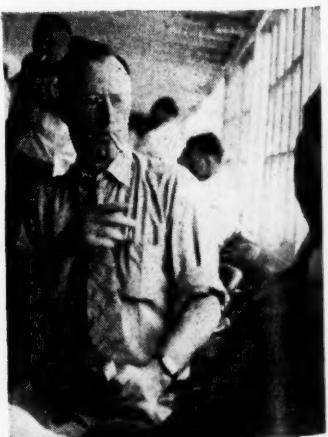
C. C. Conway, Consolidated, and Fred Weissenborn, Ill. Ops. Assn., have a serious talk.



Dr. M. M. Leighton, Ill. Geological Survey, beats the heat.



Golden Eagle's Capt. W. H. Leyhe, takes things easy.



Clyde Woosley, Pyramid, makes a point to Supt. Len Hartwell.

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Electric in 1923, using the tipple of an abandoned shaft—no washery. The Truax-Traer Coal Co. opened an abandoned shaft mine in 1929, using the old tipple. With 1933, Fulton County stripping entered an active period with the opening of the Middle Grove property of the Midland Electric Corporation, complete with modern washer. Other developments took place in the following order: 1935, Fiatt mine, Truax-Traer; 1936, Little Sister mine, Central State Collieries, Inc.; 1937, Buckheart mine, United Electric; 1941, Rapatee mine, Midland Electric, and Sunnyside mine, Central State; 1942, Bryant mine, F. C. Morgan Coal Co., and Fairview mine, Fairview Collieries Corporation. County production climbed from 994,505 tons in 1933 to 4,376,488 tons in 1941, with further increases indicated. Only one strip mine in the county is without washing facilities.

#### Five Stripping Methods Used

Stripping is done by (a) a single shovel, (b) a shovel and dragline in tandem; (c) two shovels in tandem making a wide cut, (d) a shovel with dragline on the spoil relaying excess material or (e) a dragline alone. The typical Fulton County overburden consists of a few inches of slate over the coal, then about 2 ft. of cap rock, with the remainder, about half and half, shale and surface or dirt, respectively.

Suppression of coal dust resulting from undercutting at the mines of the Pittsburgh Coal Co. was described by D. H. Davis. His paper is abstracted beginning on p. 58 of this issue.

A history of the development of priorities was the subject of a paper by Paul W. Beda, purchasing agent, Old Ben Coal Corporation, stressing their effect on the mining industry up to the promulgation of A-1-c, March 2, 1942, this last step making possible the operation of mines, "which we could not do under the lower ratings." This did not cover general supplies, which also are necessary for the operation of modern mines.

Dollar-value quotas are in the making. When set up they may not be exceeded. Purchases plus stocks must not exceed 90 days' supply. Purchasing departments can cooperate in lowering inventories.

"Maintenance" means the upkeep of a structure or equipment unit in sound working condition with a minimum expenditure of material, declared C. S. DeWitt, purchasing agent, Chicago, Wilmington & Franklin Coal Co., in a written discussion. "Repair" means restoration of a structure or equipment unit to sound working condition when such structure or unit has been rendered unsafe or unfit for further service by wear and tear, damage, destruction or failure of parts, etc.

The terms "maintenance" and "repair" do not include any of the following:

1. Replacement of an item or part thereof where such replacement is carried on the books as a fixed asset.

2. The use of material for the improvement of a structure or equipment unit through the replacement of material in the existing installation unless the item or part thereof replaced is beyond economic repair or has been rendered unusable by fire or other hazard or natural cause.

3. The use of material for additions to or expansion of a structure or equipment unit.

4. The use of material for a purpose which could not properly be charged to "Maintenance," "Repair" or the equivalent under established methods of bookkeeping.

C. W. & F. operating supplies, said Mr. DeWitt, have been placed in four categories (abbreviated):

1. "A-1-c Quota," covering the bulk of necessary operating supplies. Orders for any materials in this group may be indorsed with a A-1-c rating. No application is necessary.

2. "Mining Branch Will Determine." This list comprises conveyor belting, locomotive storage batteries, ventilating tubing, etc. An application in full detail is required for a rating for an order.

3. "Operating Supply A-8." In this group are lamp carbide, first-aid supplies, hard hats, picks and shovels, etc.; may be purchased on an order carrying the prescribed signed indorsement with A-8 rating.

4. "New Equipment." This group covers a few items made from critical materials, such as copper transmission wire, electric motors, mine cars and mine skips. Can be ordered subject to specific authorization of rating. WPB tries to provide at least minimum requirements for each mine.

#### Ladies' Day Session Winds Up Mining-Electrical Season

The Mining-Electrical Group of southern Illinois closed its season June 4 with ladies' day at the West Frankfort (Ill.) Country Club. Following luncheon, Bingo was one order of business, with \$200 in merchandise



Mrs. Bill Lindsay wins a white purse. Frank Eubanks, Old Ben, officiates as master of ceremonies.

and War Stamps and Bonds contributed by members and their sponsors as prizes.

Movies were the other item of business, the showings including a General Electric talkie on rail transportation in the United States, plus the home-grown efforts of Hadley Harvey, Ohio Brass Co., featuring Messrs. Harvey and W. H. ("Bill") Davis, Simplex Wire & Cable Co., on a trip among their coal-mining customers, complete with tandem bicycles as a means of locomotion.



One corner of the Mining-Electrical ladies' day party.



Part of the loot for the lucky.

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**builds better breakers**



GILBERTON BREAKER—Typical of the modern anthracite preparation plants, designed, built and equipped by WILMOT Engineering Co.

BREAKERS LIKE THIS  
ASSURE AMERICA THAT  
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THE COAL INDUSTRY  
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COAL Preparation UNITS

## Personal Notes

LLOYD ANDERSON, formerly superintendent of Mine 43, Peabody Coal Co., Harrisburg, Ill., has been transferred to Mine 47, at Harco, in the same capacity.

T. J. CROCKER, assistant to the general manager, Industrial Collieries Corporation, has been advanced to assistant general manager, vice K. M. Quicke, promoted. After graduation from Pennsylvania State College Mr. Crocker worked for a short time in the mining department of the Midvale Steel & Ordnance Co. His first employment with Bethlehem was at the Slickville (Pa.) mine, after which he went to Bentleyville. He went to Johnstown as chief mine inspector in 1926 and in 1934 was named superintendent of industrial relations. He became assistant to the general manager in 1940.

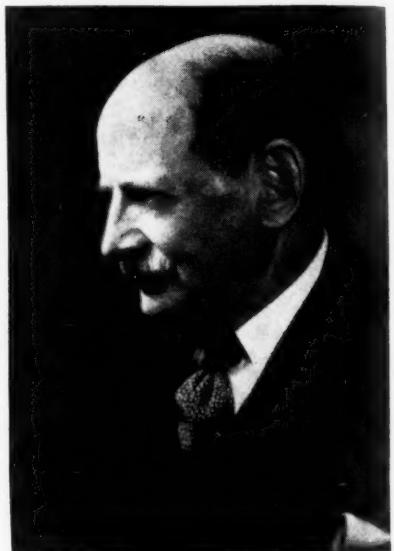
REGINALD S. DEAN, who has been chief of the Metallurgical Division of the U. S. Bureau of Mines, has been appointed Assistant Director of the Bureau. Widely known for the work which he has directed on the production of electrolytic manganese and processes for treating chrome, zinc and other ores of great importance to the war program, Dr. Dean, before joining the Bureau of Mines staff in 1929, was associated with the American Zinc, Lead & Smelting Co., Anaconda Copper Mining Co. and Western Electric Co.

W. L. DOOLITTLE, Fairmont, W. Va., has been promoted from general manager to the vice presidency of the operating department

of the Consolidation Coal Co. with offices in Fairmont.

MAX FORESTER, Fairmont, W. Va., has been named general manager of operations of the Consolidation Coal vice W. L. Doolittle, promoted.

T. R. JOHNS, vice president and general manager, Industrial Collieries Corporation, Bethlehem Steel Co.'s coal-mining subsidiary, retired from active service on June 10 after 66 years' continuous service in coal mining. He became affiliated with Bethlehem Steel in 1916, at the merger of that company and the Pennsylvania Steel Co. The coal-mining subsidiary was then known as the Penn-Mary Coal Co., later as the Bethlehem Mines Corporation; about nine years ago the present name, Industrial Collieries Corporation, was adopted. In 1940 Mr. Johns was made a vice



T. R. Johns

president of the company. Credit for building up Bethlehem's coal properties and coal-producing facilities from a relatively small beginning to their present magnitude, with operations in Pennsylvania and West Virginia, must largely go to him. Among his previous employers were the Rochester & Pittsburgh Coal Co., Keystone Coal & Coke Co., Ebensburg Coal Co., Carbon Fuel Co. and Cabin Creek Consolidated Coal Co.

C. F. LONG, Columbus, has been appointed chemist in the State Division of Mines of Ohio. His duties will include supervision of analyses of mine gases, dust, blackdamp, etc., and will involve setting up a new laboratory in the southeast Ohio mining field.

LEE LONG, for many years vice president in charge of operations, Clinchfield Coal Corporation, Dante, W. Va., has been relieved of active duty at his own request. He will retain his title of vice president and will remain with the organization, performing such duties as may be assigned to him by the president. R. S. ADAMS, general superintendent, has been appointed general manager in charge of operations as of July 1.

BYRON E. LUNDBLAD, vice president, Central Indiana Coal Co., Indianapolis, Ind., has been elected to succeed R. H. SHERWOOD, president of the same company, as a member of District 11 Coal Producers' Board.

Mr. Check says:

**J & L PERMASET**  
**Pre-formed Wire Rope**  
**resists fatigue.**

**J & L**  
**WIRE**  
**ROPE**

**JONES & LAUGHLIN STEEL CORPORATION**  
AMERICAN IRON AND STEEL WORKS  
GILMORE WIRE ROPE DIVISION • PITTSBURGH & MUNCY, PENNSYLVANIA

JOHN A. LUSE, Washington, D. C., since 1937 secretary of District 7 Bituminous Coal Board, has been named to become assistant to the president of the Carter Coal Co., with headquarters in New York City. The company's operations are at Coalwood and Caretta, W. Va., in the southern West Virginia Pocahontas field.

C. M. McCONNELL, who was engineer and assistant superintendent for twelve years for the Moffat Coal Co. at Oak Creek, Colo., and for the last few years has been assistant general superintendent for the United States Fuel Co., Hiawatha, Utah, has been promoted to general superintendent, vice W. N. Wetzel, resigned.

K. M. QUICKEL, assistant general manager, Industrial Collieries Corporation, has been promoted to general manager, vice T. R. Johns, retired. A graduate of Pennsylvania State College, Mr. Quickel worked for coal companies in Tennessee, eastern Kentucky and West Virginia before becoming affiliated with Bethlehem in 1916 as assistant engineer at Heilwood, Pa. Later he became chief engineer, and in 1923 went to Johnstown, Pa., as special engineer. He was made assistant to the general manager in 1934 and assistant general manager in 1940.

JAMES REILLEY, formerly connected with Walter Bledsoe & Co., has been appointed mine superintendent of Piney Fork No. 1 mine of the Hanna Coal Co., Piney Fork, Ohio, replacing J. D. IRELAND, who has been transferred to the general office engineering department.

J. D. ROGERS, vice president, Stonega Coke & Coal Co., has been elected president of the Virginia Coal Operators' Association; CHARLES E. RALSTON, general manager, Benedict Coal Corporation, has been named vice president; GEORGE H. ESSER, secretary-treasurer; and E. H. ROBINSON, assistant secretary-treasurer. Directors chosen are: J. P. SHOCKEY, superintendent, Consumers Mining Corporation; P. F. BROWN, general manager, Splash Dam Coal Corporation; W. H. SIENKNECHT, vice president in charge of operations, Blue Diamond Coal Co.; R. S. GRAHAM, vice president in charge of operations, Wise Coal & Coke Co., and Messrs. Rogers and Ralston.

R. A. RUFF, Elkhorn, W. Va., has been promoted from general superintendent of the Crozer Coal & Coke Co. and the Upland Coal & Coke Co. to general manager of the two companies, replacing JOHN J. LINCOLN.

FRED H. THAYER has been appointed executive secretary and treasurer of the Southern Wyoming Coal Operators' Association, vice L. W. MITCHELL, resigned.

R. L. WILHELM, formerly production engineer of Hanna Coal Co.'s Piney Fork No. 1 mine, Piney Fork, Ohio, has been promoted to general superintendent of that mine.

#### Bureau of Mines Approval

One approval of permissible equipment was issued by the U. S. Bureau of Mines in May, as follows: Goodman Mfg. Co.—Type 95-B-24 belt conveyor; 3-hp. motor, 250 volts, d.c.; Approval 449; May 9.

## Implementing Safety Under War Conditions Theme of Mine Inspectors' Meeting

(Continued from page 41)

both sides except in a very few instances on the right flank, so this road, Mr. Reese believed, could have been converted quickly to an intake by erecting a few temporary stoppings. Other fighting methods that Mr. Reese questioned were allowing 23,000 cu.ft. of air per minute to pass over the fire. In his opinion, the fire should have been sealed, as all the men it endangered were safely out of the mine.

When, five hours after the fire started, the men to be rescued were all out of the mine, attempts were made to put out the fire, using water from a pipeline already installed to wet and control dust at the working face. In about 11 hours (6 p.m.), the fire appeared to be under control except in the belt heading, where the upper belt, 14 in. above the floor, was loaded with coal.

*Workings Piled With Cable*—Where crosscuts had shaker lines in them, they were provided with double stoppings of brattice cloth, and these had been burned by the fire. In the rooms, coiled electric cables were lying, for the workings had advanced only 150 to 175 ft. and the cables were 350 ft. long, so the rest of the cable was looped or lying in piles at, or close to, the belt conveyor. The roof coal was falling, and it was to be assumed that greases and oils for lubrication were nearby and might add to the danger.

Where 55,000 cu.ft. of air per minute was passing, methane contact had risen to 0.96 percent, carbon monoxide to 0.2 percent. As these gases came from the fire area and were carried away with only 23,000 cu.ft. of air, much higher percentages must have been present in the fire area. For this reason, it was decided by all in control that all

seven openings and several drillholes be sealed at the surface, which job was completed late on Dec. 12. Much credit was bestowed by Mr. Reese on those who provided for the rescue of the men behind the fire and for the construction of the bleeder headings driven ahead of, and connected with, the fire area, by which many lives were saved.

*Dust-Allaying Water Line Used for Sampling*—A dust-control water line extending from Cats Run shaft to the working faces was blown free of water and equipped with a vacuum pump through which samples of air were taken. Eleven days later, Dec. 23, plans were completed to reopen the mine by air locks, but, after removing the two bodies, a high water gage in the mine caused work to be suspended until Jan. 5, 1942.

While the mine was sealed, about 35 company employees were trained in apparatus work, and in all 60 were trained. As the first crews gained experience, an inexperienced man or two would be placed in a crew, of which at least three men had experience. Thus eventually nine crews were organized. On each shift three crews operated, two inside the airlock and one emergency crew at fresh-air bases outside the airlock, then one crew in and two crews out.

On entering the mine, Jan. 5, to erect stoppings, the water gage was minus 4.8 in. After seven seals had been erected the men were withdrawn and the fan was started on slow speed, producing 40,000 cu.ft. of air per minute with the highest methane reading of 9 percent and an oxygen content at the start of ventilation of 10 percent. The next advance required 17 stoppings. In all, 16 airlocks, 122 plastered wood stoppings and 33 concrete stoppings were built.

#### Short Circuit Probable Cause

The fire is still sealed, with the real cause undiscovered, but a short circuit in a trailing cable was the probable cause. Preparations should always be made so that workings can be promptly sealed in case of a mine fire—doors locked open until needed, and materials stored where they would be available for sealing.

Describing the sealing of a mine fire in Montour No. 10, R. H. Nicholas, chief inspector, Pittsburgh Coal Co., Pittsburgh, Pa., said that the company for many years had made it a practice to seal the intake first. At the Montour fire, originating Oct. 8 of last year, the fire, which was sealed, was confined to a single entry. A brief of this article of Mr. Nicholas will appear shortly in *Coal Age*.

*Method of Obtaining Compliance With Safety Provisions*—A federal inspector, asserted J. J. Forbes, chief, Coal-Mine Inspection Division, U. S. Bureau of Mines, Pittsburgh, Pa., is required to spend enough time at each mine to make a complete investigation of safety conditions and practices in the mine and at the surface plant and to determine wherein conditions and practices differ from the tentative standards. The in-

spector may make oral suggestions to the mine official who accompanies him and if he discovers an immediate danger in which lives are in jeopardy and mine officials do not act promptly to remove such danger, he is instructed to notify the State mine inspector of the district in which the danger is discovered. In one case, the oxygen percentage was found to be below 18 percent and the air contained small quantities of methane. The State inspector who accompanied the federal inspector ordered the men to cease work until ventilation was adequate.

**Federal Inspectors' Advisements Violate State Laws**—State inspectors are made responsible by statute for the enforcement of mining laws and subject to penalties for non-enforcement, but federal inspectors have no such statutory imposition, declared Edwin C. Curtis, State mine inspector, Kingston, Pa. Federal inspectors recommend provisions contrary both to the statutes and to what State mine inspectors believe is safe. They recommend that hooks or devices that will keep a mine door open be removed. State inspectors believe that removal of such devices expose the door attendant to an extreme transportation hazard. Federal inspectors recommend that crosscuts be driven at intervals of not more than 80 ft., but the

State inspectors want compliance with the law requiring crosscuts at 60-ft. intervals.

**Pay With Lives for Timber Recovered**—Federal inspectors want safety posts set and urge timber recovery, but anthracite State inspectors believe recovery of timber should never be permitted. In 1941, falls caused the deaths of 88 persons in the bituminous mines of Pennsylvania; eleven, or 12½ percent, of these fatalities occurred while removing posts. During that same period 98 lives were lost in the anthracite region; only one was lost in the recovery of timber. A Bureau man said it would be better if only officials carried safety lamps, which is a violation of Pennsylvania law and a dangerous practice. Safety lamps should be more frequently, not less frequently, used.

**Other Conflicts in Safety Rules**—Many other tentative suggestions in Circular 7204 of the U. S. Bureau of Mines conflict with State requirements such as provisions for fireproof buildings, stairs and landings in airshafts instead of a secondary hoist, use of canvas in controlling ventilation, method of plugging gas wells, distance required on surface between mine openings, use of permissible equipment in atmospheres contaminated with methane up to 2 percent and sealing of abandoned mine areas.

#### Bureau Should Make Prompt Reports

Anxiety regarding federal inspections has waned, declared N. P. Rhinehart, chief, West Virginia Department of Mines, Charleston, W. Va., but if we are to receive the desired benefits from federal inspection reports they must be available at the mine immediately after the inspection is finished or sections will be completed and abandoned before the federal reports are received. West Virginia State inspectors promptly report every unsatisfactory condition and practice, and no ill effects result from this action.

The training provided for federal inspectors is excellent, asserted G. M. Patterson, chief, Department of Mines and Minerals, Lexington, Ky. Like instruction would be desirable for State inspectors, company safety men and mine officials generally, and, fortunately, such training has been made available to mining men. One Kentucky company already has sent two men to Pittsburgh to be trained. More mines should be inspected in this first year of the Bureau's inspectional activity and those found in bad condition should be reinspected promptly, and that this will be done the industry should understand. Location of defects should be specifically stated, so that the State inspectors can act promptly.



Thomas G. Reese, deputy State mine inspector, Salem, Ohio.



R. H. Nicholas, chief mine inspector, Pittsburgh Coal Co.



Patrick A. Grady, Carrs Fork Coal Co., Allock, Ky., proposes Mrs. Moses and Mrs. Ryan as honorary members.



D. L. McElroy, Coal Priorities Mining Branch, War Production Board.



A. L. Milligan, E. I. duPont de Nemours & Co., Huntington, W. Va. (left); Fred O. See, district manager, Cardox Corporation, Louisa, Ky.; F. P. Kerr, assistant general manager, Eastern Coal Corporation, Stone, Ky.; G. H. Sambrook, assistant safety director, H. C. Frick Coke Co.; W. E. Wheeler, safety director, Big Sandy-Elkhorn Coal Association; A. D. Sisk, safety director, Big Sandy-Elkhorn Coal Association; and Will Prentice, inspector, Pocahontas Fuel Co.



Ralph C. Beerbower (left), Goodman Mfg. Co.; H. R. Owens, Mrs. McCaa, C. C. McDowell; George McCaa, State mine inspector; W. N. Riggs, superintendent, coal-mine rating and inspection bureau; J. E. Stanton, federal mine inspector, Madisonville, Ky.; E. C. Curtis, Mrs. Clyde C. Lutton, wife of safety director, H. C. Frick Coke Co.; H. J. Grafton, chief engineer, Eureka Casualty Co.



Colloquy between George H. Foster (left), State mine inspector, Massillon, Ohio, and W. J. Fene, U. S. Bureau of Mines.



L. W. Huber (left), Mine Safety Appliances Co.; J. F. Bryson, Harlan County Coal Operators' safety director, and G. M. Patterson, Kentucky's chief mine inspector.



C. E. Berner, Pennsylvania's coal-mine rating chief (left), chats with N. P. Rhinehart, West Virginia's chief inspector.



Edwin C. Curtis, Patrick J. Friel and Harry R. Owens, State mine inspectors, Kingston, Shamokin and Trucksville, Pa., respectively. Harry, on right, leads singing.



Secretary Clyde A. McDowell (left) confers with E. J. McCrossin, Alabama's chief inspector, and D. M. Ryan, in foreground.



E. A. Starling (left), Frankfort, Ky.; J. J. Rutledge, State of Maryland, Annapolis; and D. M. ("Dick") Ryan, Industrial Commission, St. Clairsville, Ohio.



Richard Maize, Secretary of Mines and Coordinator of Priorities Board for Mining, State of Pennsylvania, suggests institute make its own standards. Thomas Moses, in chair, awaits motion.



President Thomas Moses congratulates his wife on her new dignity as honorary member, while Miss Jefferson, recorder, prepares to enter suitable comment in her report.



R. L. Jenkins (left), of Charleston; Joseph Bierer, of Morgantown, and M. C. McGraw, of Farmington, all State mine inspectors of West Virginia, stop discussion of institute topics to face camera.

Sprinkling may be prohibitively expensive and pipe difficult to obtain, so rock-dusting should be stressed. Recommendations would have more weight if based on State law and not on the decisions of a far-away nebulous safety board. Federal inspectors might devote some of their time to organizing and instructing classes.

**Putting Operation in a Straitjacket**—Rules without consideration of conditions existing will put a heavy burden on the industry. A high road, said Harry M. Moses, president, H. C. Frick Coke Co., with a bad curve, around which an automobile cannot travel safely at more than 10 miles an hour, might be the basis of a regulation that no automobile travel exceeding that speed should be permitted anywhere, a type of regulation to be condemned as restrictive on economic operation and as ruinous to any industry.

#### Wise Regulations Asked

Regulations should not be based on the worst of practices and conditions but have in view the immediate operating environment. Nor should the Bureau inject itself into employer-employee relationships but restrict its purview to safety. Mr. Moses declared that an agency be provided to settle controversies as to mining practice and that the federal inspection service should not set itself up, without such discussion, as the final arbiter of mining technique.

**Standby Power and Parallel-Throw Levers**—Some of the recommendations recently made, his company has made part of its practice in the past but now it recognizes that it involves the installation of equipment, such as standbys for driving fans, which standbys now no longer are serviceable yet have never been used. Should they be replaced? Yet their presence is demanded by Bureau Code Standard 01-f in every gassy mine and this is rigorously defined as one having 0.25 percent of methane present. Similarly, the federal inspectors would like the company to throw out switch-throw levers, yet for five years they have not been directly or indirectly the cause of an accident, and the records on this subject do not go back any further.

The federal inspection service, lacking police powers, must depend upon prestige and the excellence of its research and reports to accomplish its purposes, stated C. R. Stahl, Powellton division, Koppers Coal Division, Eastern Gas & Fuel Associates, speaking for P. C. Thomas, vice president. Such control probably is better than police control. Certainly police control as provided by the states has not placed the accident-prevention record of the mining industry on a plane with that of railroading, civil aeronautics and the manufacture and transportation of explosives.

**Speed and Detail Recommended**—Richard Maize, Secretary of Mines, State of Pennsylvania, said he had made many objections to the Bureau's methods and had obtained courtesy and action. He had requested copies of preliminary reports of inspections and had obtained them. If an accident occurred between writing and publishing a report condemnatory of some practice, the federal inspection service would be severely condemned by the public. This fact that service has well recognized.

*Inspector Has Two New War Duties*—

Confronted with a grave crisis, the inspector's task, declared Mr. Maize, should include reasonable limits: (1) health and safety, (2) operational advice if requested and (3) effort to induce mine worker to produce a clean product. The emergency justifies no let-up in safety, but now untried and expensive methods or ideas and increased personnel should not be required. Opportunities for qualifying men for certificates as miners should be promptly provided. If the operators will give lists of absentees, the mine inspectors will do their best to make them come regularly to work.

Similar sentiments were expressed by W. T. Winning, mines inspector, Bituminous Casualty Corp., speaking for C. F. Herbert, Safety Engineering Department, of the same organization, Rock Island, Ill. Other speakers on this subject were Henry S. Wallace, director, Bureau of Mines and Mining, Indianapolis, Ind.; A. H. Findeis-in, mining engineer, Industrial Commission of Wisconsin, Madison, Wis., who both thought the promotion of safety was all the mine inspector could undertake satisfactorily, and James McKim, mining supervisor, U. S. Geological Survey, Miami, Okla., said that the survey supervisors had these functions as part of their normal duties.

Explaining that an A-3 order could no longer be ousted by an A-2 order if the A-3 order was within 15 days of completion or if major changes would be needed to convert the material in the A-3 order to fit the structure of the A-2 order, D. L. McElroy, technical adviser, mining branch, War Production Board, discussed priorities at the second session.

Honorary membership was voted to Mrs. Mary Ryan and Mrs. Thomas Moses in recognition of their husbands' activities in the institute. By vote it was decided that the institute would make its own standards, submitting them to no one. The powder-container standards (*Coal Age*, October, 1941, p. 124) then were approved.

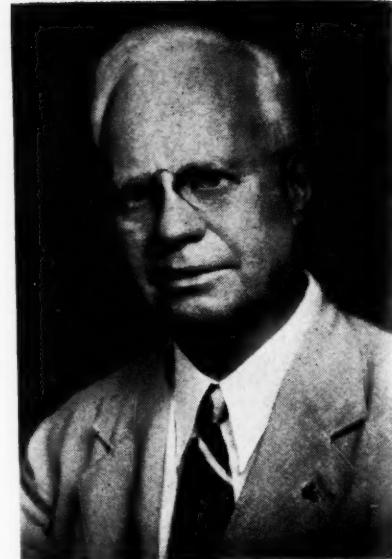
#### War Board Functions Outlined

The functions and organization of the war agencies within the Office for Emergency Management are described in an OEM handbook issued June 17. The 72-page booklet describes in detail the organization of the War Production Board, the Office of Price Administration and the other constituent agencies of OEM. Personnel is listed in most cases down to the branch level in each agency. Included are organization charts of WPB and the Bureau of Industry branches of the WPB Division of Industry Operations, as well as a chart showing the relationship of the various federal war agencies.

Copies of the booklet are available in Room 1501, New Social Security Building, and from the Superintendent of Documents, Washington, D. C., and at OEM field offices.

#### Correcting the Record

Through a typographical error, it was stated in the June *Coal Age* (p. 118) that Lane W. Hildreth had been associated with the WPA before appointment as chief, Mining Machinery Section, War Production Board. Correctly, he had been with the War Production Board.



Harris & Ewing

George S. Pope

#### George S. Pope Retires

George S. Pope, technical adviser on fuel problems in the Procurement Division, U. S. Treasury Department, filed papers for retirement on June 15, after more than 36 years in the government service. He was first employed on March 20, 1906, in fuel engineering work of testing coals under boilers at the St. Louis (Mo.) coal testing plant, U. S. Geological Survey. Nine months later he was transferred to Washington to engage in initial studies concerning the character and quality of coals purchased by the Federal Government, going to the U. S. Bureau of Mines in 1910, when the latter was organized. He was appointed chief engineer of the Government Fuel Yards on July 1, 1918. When the Government Fuel Yards organization as such was discontinued in 1933 and its various units were merged with units of the Procurement Division, Mr. Pope became technical adviser on fuel problems in the Procurement Division. With enactment of the Bituminous Coal Act of 1937 he was made the Procurement Division's liaison representative with the National Bituminous Coal Commission and its successor, the Bituminous Coal Division.

Besides being the author of many government bulletins on the purchase of coal under specifications and on coal sampling Mr. Pope was a member of a committee of the American Society for Testing Materials for the development of standard methods of sampling coal. The method recommended by this committee was adopted by the A.S.T.M. and also was adopted as the American Standard Method.

#### Four New Mines for Oklahoma

Four new coal mines are to be developed by the McAlester Fuel Co. in Oklahoma, two in Pittsburg County and two in Haskell County. According to Representative Wilburn Cartright, who announced that development of the mines was in contemplation, this expansion comes as the result of the reinstatement of two iron and steel furnace projects in Texas.

## Big Sandy-Elkhorn Operators Scan Pressing Problems

Reelection of officers and a banquet session featured by short addresses on business and production problems were principal items on the agenda at the annual meeting of the Big Sandy-Elkhorn Coal Operators' Association, held June 5 at the Henry Clay Hotel, Ashland, Ky. Production from the Big Sandy-Elkhorn district in 1941 was 10,446,670 tons, a gain of 3.7 percent over 1940. Output in 1942 will exceed 12,000,000, H. S. Homan, association secretary, estimates.

Harry La Viers, vice president, South-East Coal Co., and president, Princess Elkhorn Coal Co., headed the list of officers chosen for another term. L. C. Campbell, general manager of mines, Koppers Coal Division, Eastern Gas & Fuel Associates, was elected vice president; H. H. Kuhling, secretary, Elkhorn Collieries Corporation, was named treasurer, and H. S. Homan, secretary.

In addition to the association president and vice president, fourteen men make up the directorate, as follows: J. E. Bowman, vice president, Utilities Elkhorn Coal Co.; Harry B. Crane, general superintendent, Elk Horn Coal Corporation; W. L. Doolittle, vice president in charge of operations, Consolidation Coal Co.; H. K. English, vice president, Beaver Coal & Mining Co. and Clear Branch Coal & Mining Co.; J. R. Hurt, secretary, Sandy Valley Coal Co.; A. H. Mandt, manager, Stephens Elkhorn Fuel Corporation; A. J. Mandt, vice president and general manager, Central Elkhorn Coal Co.; E. R. Price, general superintendent, Inland Steel Co.; W. F. Pioch, manager, North-East Coal Co.; C. D. Reed, vice president, Turner Elkhorn Mining Co.; Alan J. Smith, president, South-East Coal Co., and J. D. Snyder, acting division manager, Consolidation Coal Co.

Speakers at the banquet, with Mr. La Viers as toastmaster, were: E. R. Burke, former U. S. Senator from Nebraska and president of the Southern Coal Producers' Association; A. J. May, Congressman from eastern Kentucky and member of the House Military Affairs Committee; Wayne Ellis, secretary of Coal Producers' Board No. 8; Walter Thurmond, secretary of the Southern Coal Producers' Association; C. W. Wilson Jr., technical adviser of field service, War Production Board, for Alabama, Tennessee and Kentucky; Arthur Koontz, attorney, Charleston, W. Va.; Chauncey Forney, editor, *Ashland Daily Independent*; G. M. Patterson, chief, Kentucky Department of Mines and Minerals; R. E. Hodges, assistant general manager, Kentucky & West Virginia Power Co.; Harry Gandy Jr., National Coal Association; James E. Hart, Island Creek Coal Co.; W. O. Hackbarth, Co-operative Farm Bureau of Ohio, and J. H. Edwards, associate editor of *Coal Age*.

## New Preparation Facilities

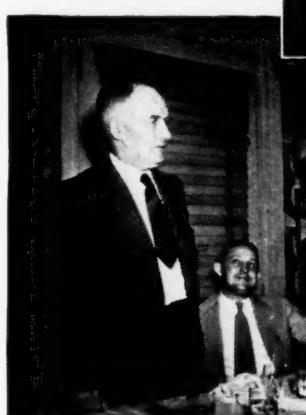
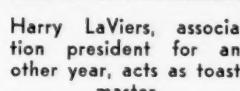
JOHN CONLON COAL CO., Wilkes-Barre, Pa.—Contract closed with Deister Concentrator Co. for SuperDuty No. 7 coal-washing table to handle No. 5 buckwheat.

EASTERN GAS & FUEL ASSOCIATES, Koppers Coal Division, Kopperston, W. Va.—Contract closed with McNally-Pittsburgh Mfg. Corporation for additions to existing tipple and



Harry Gandy Jr., National Coal Association.

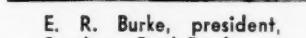
Walter Thurmond, secretary, Southern Coal Producers' Association.



G. M. Patterson, chief, Kentucky Department of Mines and Minerals.



Congressman A. J. May, member of House Military Affairs Committee.



E. R. Burke, president, Southern Coal Producers' Association.



Wayne Ellis (left), secretary, Producers' Board No. 8, and C. W. Wilson Jr., technical adviser, WPB field service.



Early Comers Pose Before Sitting Down

Top row (left to right): A. D. Sisk, safety director of the association; G. M. Patterson, chief, Kentucky Department of Mines and Minerals; J. T. Parker, superintendent, Inland Steel Co., Wheelwright; F. E. Bedale, safety manager, Consolidation Coal Co., Fairmont, W. Va.; W. L. Doolittle, vice president in charge of operations, Consolidation Coal Co., Jenkins; H. S. Homan, secretary of the association; W. L. Merideth, assistant to the secretary; and C. W. Wilson, technical adviser of field service, W.P.B., for Alabama, Tennessee and Kentucky.

Center row: Arthur Koontz, Charleston, W. Va.; W. W. Goldsmith, co-receiver of Elk Horn Coal Corporation; E. R. Price, general superintendent, Inland Steel Co., Wheelwright; Harry B. Crane, general superintendent, Elk Horn Coal Corporation, Flemington; R. E. Hodges, assistant general manager, Kentucky & West Virginia Power Co.; Harry Gandy Jr., National Coal Association; E. R. Burke, former U. S. Senator from Nebraska and president of the Southern Coal Producers' Association; Fred Roper, chief engineer, Consolidation Coal Co., New York; Walter Thurmond, secretary, Southern Coal Producers' Association; Harry LaViers, vice president of the South-East Coal Co., president of the Princess Elkhorn Coal Co. and president of the association; A. J. May, congressman; T. W. English, labor adviser of the association; Wayne Ellis, secretary, Board No. 8; C. D. Reed, vice president, Turner Elkhorn Mining Co., Drift; J. E. Hart, Island Creek Coal Co.; and Robert May, son of Congressman May.

Bottom row: Chauncey Forney, editor, *Ashland Daily Independent*; J. E. Bowman, vice president, Utilities Elkhorn Coal Co., Pikeville, and J. R. Hurt, secretary, Sandy Valley Coal Co., and trustee Payne-Baber Coal Co.

# Americans Should Know These

## FLAG RULES

OLD GLORY proudly waving in the breeze is reproduced on our front cover this month. Its appearance at this time, the anniversary month of American independence, is peculiarly fitting, with most of the nations of the earth engaged in an all-out struggle to maintain or obtain freedom of thought, action and belief. In view of the many warnings that victory for the United Nations depended on the progress of massing American personnel and material this year, it is significant that our production of war materials already has passed that of Great Britain.

Appearance of bombers in the Bal-

kans and the Mediterranean manned by Americans, and the certainty that they will be in steadily increasing evidence daily will prove of no less interest to non-combatants in this country than to our allies. Our flag, the symbol of our determination to keep democracy alive, therefore is more than ever an object of reverence and respect. How it may be properly honored is the subject of the following material, taken from regulations issued by the War Department, and the Flag code regarding display as revised and accepted by the Second National Flag Conference at Washington, D. C.

### Civilian Respect to the Flag

When the Flag is being raised or lowered or when it passes (uncased) in a parade, a man not in uniform salutes by removing his hat with his right hand and placing it over his heart while standing upright with heels together. A woman or hatless man in civilian attire places the right hand over the heart, while standing upright.

Whenever the "Star Spangled Banner" is played, a civilian stands upright and faces the music, with right hand over heart, except when the Flag is being lowered at sunset, on which occasion he faces the Flag and salutes as described above. The salute is held until the last note of the anthem is played.

### How to Display the Flag

1. The flag should be displayed from sunrise to sunset. It should be hoisted briskly, but should be lowered slowly and ceremoniously. The flag should be displayed on all National and State holidays and on historic and special occasions.

2. When carried in a procession with other flag or flags, the Flag of the United States of America should be either on the marching right—i.e., the Flag's own right—or when there is a line of other flags, the Flag of the United States of America may be in front of the center of that line.

3. When displayed with another flag against a wall from crossed staffs, the Flag of the United States of America should be on the right, the Flag's own right (the observer's left), and its staff should be in front of the staff of the other flag.

4. When a number of flags of States or cities or pennants of societies are grouped, and displayed from staffs with the Flag

of the United States of America, the latter should be at the center or at the highest point of the group.

5. When flags of States or cities or pennants of societies are flown on the same halyard with the Flag of the United States of America, the latter should always be at the peak. When flown from adjacent masts, the Flag of the United States of America should be hoisted first and lowered last. No such flag or pennant flown in the former position should be placed above or in the latter position to the right of the Flag of the United States of America; i.e., to the observer's left.

6. When flags of two or more nations are displayed, they should be flown from separate masts at the same height and the flags should be of approximately equal size. International usage forbids the display of the flag of one nation above that of another nation in time of peace.

7. When the Flag is displayed from a staff projecting horizontally or at an angle from the window sill, balcony, or front of building, the union of the Flag should go clear to the peak unless the Flag is at half-mast. (When the Flag is suspended over a sidewalk from a rope extending from a house to a pole at the edge of the sidewalk, the Flag should be hoisted out from the building toward the pole, union first.)

8. When the Flag is displayed in a manner other than by being flown from a mast, it should be displayed flat, whether indoors or out. When displayed either horizontally or vertically against a wall, the union should be uppermost and to the Flag's own right, i.e., to the observer's left. When displayed in a window it should be displayed the same way; that is, with the union or blue field to the left of the observer in the street. When festoons, rosettes, or drapings

are desired, bunting of blue, white, and red should be used, but never the Flag.

9. When displayed over the middle of the street, the Flag should be suspended vertically with the union to the north in an east-and-west street or to the east in a north-and-south street.

10. When used on a speaker's platform, the Flag, if displayed flat, should be displayed above and behind the speaker. If flown from a staff it should be in the position of honor, at the speaker's right. It should never be used to cover the speaker's desk nor to drape over the front of the platform, but bunting may be used for this purpose, if desired.

11. When used in connection with the unveiling of a statue or monument, the Flag should form a distinctive feature during the ceremony, but the Flag itself should never be used as the covering for the statue.

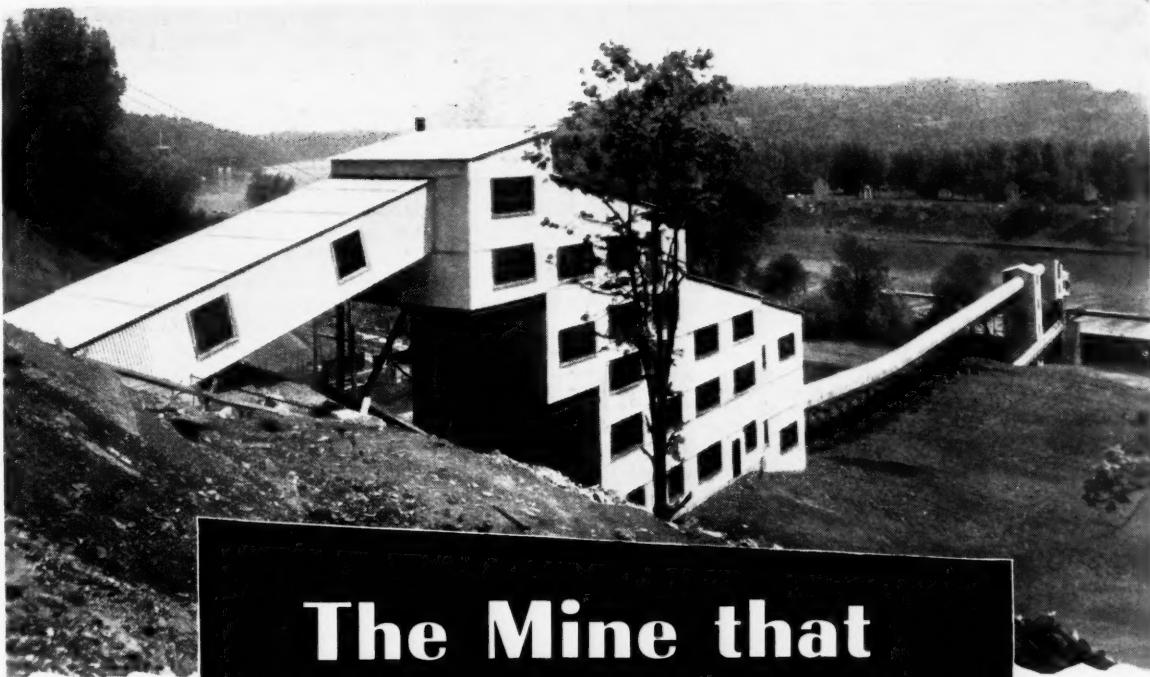
12. When flown at half-mast, the Flag should be hoisted to the peak for an instant and then lowered to the half-mast position; but before lowering the Flag for the day it should be raised again to the peak. By half-mast is meant hauling down the Flag to one-half the distance between the top and bottom of the mast. (On a pole, the Flag flies its own width below the peak.)

13. Flags flown from fixed masts are placed at half-mast to indicate mourning. When the Flag is displayed on a small staff, as when carried in a parade, mourning is indicated by attaching two streamers of black crepe to the spearhead, allowing the streamers to fall naturally. Crepe is used on the flagstaff only by order of the President.

14. When used to cover a casket, the Flag should be placed so that the union is at the head and over the left shoulder. The Flag should not be lowered into the grave nor allowed to touch the ground. The casket should be carried foot first.

15. When the Flag is displayed in the body of the church, it should be from a staff placed in the position of honor at the congregation's right as they face the clergyman. The service flag, the State flag, or other flag should be at the left of the congregation. If in the chancel or on the platform, the Flag of the United States of America should be placed at the clergyman's right as he faces the congregation and the other flags at his left.

16. When the Flag is in such a condition that it is no longer a fitting emblem for display, it should not be cast aside or used in any way that might be viewed as disrespectful to the national colors, but should be destroyed as a whole privately, preferably by burning or by some other method in harmony with the reverence and respect we owe to the emblem representing our country.



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washery to handle 650 t.p.h. of mine-run coal and additional cleaning facilities in a Menzies cone to handle 175 t.p.h. of 2 $\frac{1}{4}$  x 3 $\frac{1}{8}$  in. coal; to be completed Jan. 1, 1943.

**GILBERTON COAL CO.**, Gilberton Breaker, Gilberton, Pa.—Contract closed with Wilmot Engineering Co. for one 5-ft.-diameter Wilmot Hydrotator to prepare 35 t.p.h. of No. 1 buckwheat coal.

**PYRAMID COAL CORPORATION**, Victory Mine, near Seelyville, Ind. Contract closed with McNally-Pittsburg Mfg. Corporation for tipple and washery to crush entire product to minus 6 in. and wash at rate of 700 t.p.h.

in McNally-Norton automatic washers; all coal below 1 $\frac{1}{2}$  in. is to be dried in McNally-Vissac dryers; tipple to be 5-track, complete with crushing and mixing facilities; to be completed Jan. 1, 1943.

**REPUBLIC STEEL CORPORATION**, Clyde Mine, Fredericktown, Pa.—Contract closed with Roberts & Schaefer Co. for complete tipple and preparation plant consisting of tipple dumping facilities (revolving dump, car feeder, etc.) having capacity of 700 t.p.h. of mine-run coal; belt conveyor to picking and crushing facilities located over a 2,000-ton reinforced-concrete storage bin for blending coals from mine; belt conveyor to cleaning plant of concrete and steel construction

utilizing Jeffrey Baum-type jigs, and Hydro-tators to wash 0x4-in. coal at rate of 700 t.p.h.; and with complete dewatering and water-settling facilities and centrifugal dryers; also included are river loading facilities for all cleaned coal at rate of 700 t.p.h.; to be completed Dec. 1.

### Alberta Stripping Operation Ready to Start

A coal-stripping operation on Grassy Lake, 60 miles east of Lethbridge, Alberta, on the main Canadian Pacific Ry. line, was scheduled to be brought into production late in June by two Toronto men, Norman Vincent and C. C. Stee, director of East Malaric Gold Mines and Malaric Goldfields, Ltd. Machinery is in place ready for immediate production of 200 tons a day, which may later be stepped up to 500 or even 1,000 tons a day, if possible.

More than 1,000,000 tons of coal is said to be blocked out on the 160-acre property, leased from the Hudson Bay Co. at a royalty of 10c. for each ton extracted.

### Role of Rubber in War Shown in Film

The dramatic story of rubber in transportation and its vital role in the fight to be carried by the United States and United Nations is the theme of a new sound film now ready for national release. Titled "Keep 'Em Rolling," the film runs 25 minutes and was prepared under supervision of the truck- and bus-tire department of B. F. Goodrich Co.

Organized groups may obtain a showing of the film in 16-mm. size by request to the company's principal offices in Akron, Ohio, or by application to any of the sales agencies in the field, including district offices, stores and dealers.

### Definitions of Electrical Terms Issued as American Standard

A new American Standard known as "Definitions of Electrical Terms, C42," sponsored by the American Institute of Electrical Engineers, has been published for general distribution. This is the first time the definitions of the important terms common to all branches of the art as well as those specifically related to each of the various branches have been assembled and printed under one cover.

The primary aim in formulating the definitions has been to express for each term the meaning generally associated with it in electrical engineering in America. The definitions have been generalized wherever practicable to avoid precluding the various specific interpretations which may be attached to a term in particular applications. It has been recognized that brief, simplified phrasing usually presents the clearer word picture. Amplifying notes accompany certain definitions when the added information is particularly helpful, but those notes are not a legitimate part of the standard phrasing. Words used in the definitions have been employed in the accepted meaning as given in the recognized dictionaries, unless they have

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been defined specifically in this glossary. Specialized definitions for common words have been discouraged.

The book contains 311 pages, 8x11 in., on high-quality paper, with dark blue fabricoid binding. Price is \$1.00 net each in U.S.A.; \$1.25 outside U.S.A.

### Eastern Coal Tipple Burns

Stone No. 3 tipple of the Eastern Coal Corporation, Stone, Ky., was destroyed June 17 by fire which also disrupted work at Nos. 1, 7 and 11 operations, according to an announcement by Lewis C. Tierney, an official of the company. Of wood construction, the structure burned rapidly, entailing a loss of \$75,000.

Work has been resumed at three of the four mines affected, but Mr. Tierney said it would be about 30 days before No. 3 would be back at work. The company plans to bring coal from this mine out over the old No. 8 tipple, but before this can be done it will be necessary to make repairs, lay track, reconstruct the haulageway to the structure and make other changes. No. 3 employs about 300 men, with an output of about 34 railroad cars per day.

## Trade Literature

**AIR COMPRESSORS**—Schramm, Inc., West Chester, Pa. Catalog 4215 pictures and describes Schramm Fordair compressors in various mountings, giving specifications.

**CONVEYOR**—Link-Belt Co., Chicago. Catalog 2075 describes the Bulk-Flo elevator-conveyor. With two new sizes included, power formulas and other engineering data have been added, as well as diagrams showing paths of operation, lists of materials that can be handled, and illustrated case studies, with tables of sizes, capacities, dimensions, etc.

**DUSTPROOFING AND FREEZEPREOFING COAL WITH CALCIUM CHLORIDE**—Calcium Chloride Association, Detroit, Mich. Bulletin 37 gives general mechanical advice on calcium chloride treatment, telling what it is and how it acts on coal, including dustproofing and freezeproofing methods.

**HOISTS**—Coffing Hoist Co., Danville, Ill. Catalog G6 describes Coffing products, including ratchet lever hoists and parts, safety load binders and parts, utility maintenance hoists, electric hoists and accessories, spur gear chain hoists and parts, differential chain hoists, and I-beam trolleys.

**INCLOSED BUSBAR SYSTEM**—Trumbull Electric Co., Plainville, Conn. Circular 337 illustrates and describes new features of the L.V.D. (low voltage drop) inclosed busbar distribution system. An interesting development is the addition of the new "airated" L.V.D. system, in which the busbars are inclosed in steel casings provided with a series of openings which facilitate circulation of air and so increase current-carrying capacity by some 35 to 50 percent—which in turn reduces the cost of installation.

**INDUSTRIAL RUBBER CONSERVATION**—United

States Rubber Co., New York City. Booklet gives complete and explicit instructions for proper care of rubber products in use by manufacturers, from initial design through inventory and storage to use, maintenance, inspection and repair. All mechanical rubber goods are included, such as hose of all types; transmission, conveyor and elevator belts; mechanical packings; electrical tapes, wires and cables; molded and extruded rubber goods; rubber-lined equipment; rubber mountings, mats and matting; and rubber-and-resin-bonded grinding wheels.

**NEGATIVE TEMPERATURE COEFFICIENT RESISTANCE MATERIAL**—Keystone Carbon Co., St. Marys, Pa. Folder describes material whose resistance is said to decrease with rising temperature—developed to compensate for resistance changes due to temperature variations, to reduce or eliminate initial current surge in electrical equipment, to provide various degrees of time delay in electrical units, and used as a remote unit for temperature measurement, etc.

**OIL RECLAMATION**—Gale Oil Separator Co., Inc., New York City. Folder describes Gale reclamation oil system, which is said to intercept, desludge and clarify oil so completely that it can be used over and over again.

**RAIL BONDS**—American Steel & Wire Co., Cleveland, Ohio. Catalog covers the company's complete line of rail bonds for power and signal circuits. A section giving technical information is included.

**RUBBER BELTS**—Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., Passaic, N. J. Wall card gives complete instructions for proper installation and care of rubber transmission belts, V-belts and conveyor belts.

**SCRAPER METHODS**—Ingersoll-Rand Co.,

New York City. Book entitled "Modern Methods for Scraper Mucking and Loading," of 184 pages, with more than 400 halftones and schematic drawings, contains a wealth of detailed data and numerous sample problems. It is divided into four parts: (1) Scraper Hoist Equipment, (2) Metal Mining Methods, (3) Coal, Non-Metallic and Miscellaneous Mining Methods, and (4) Hoists and Engineering Data.

**SWITCHBOARD INSTRUMENTS**—Roller-Smith Co., Bethlehem, Pa. Catalog 4220 describes indicating instruments for mounting on switchboards. These instruments include d.c. ammeters and voltmeters and a.c. ammeters, voltmeters, wattmeters, frequency and power-factor meters, synchroscopes, rectangular triplex ammeters, and horizontal edgewise triplex ammeters.

**VENTILATION**—E. I. duPont de Nemours & Co., Inc., Wilmington, Del. Booklet entitled "Ventube for Auxiliary Ventilation in Coal Mines, Metal Mines, Tunnel Construction" contains 50 halftones and a score of diagrams illustrating how Ventube flexible rubberized ventilating duct is installed to bring fresh air to the working face. Sections describe development of Ventube, give separate treatments of auxiliary ventilation in coal and metal mines and tunnel construction, and include a chart for computing the volume of air a fan will deliver at different distances.

**WOVEN-WIRE SCREEN**—Newark Wire Cloth Co., Newark, N. J. Catalog C, a handbook of useful information for the practical buyer of wire cloth and other woven-wire products, is a manual designed to remove the mystery and risk from their application, selection and ultimate use. Included are a glossary of terms; instructions on how to compute mesh, space, open area; illustrations of weaves, and a section on selecting, ordering and testing.

## Combustion and Utilization Progress Surveyed at Battelle Conference

(Continued from page 43)

effects of these hygroscopic materials on metal parts in now under way.

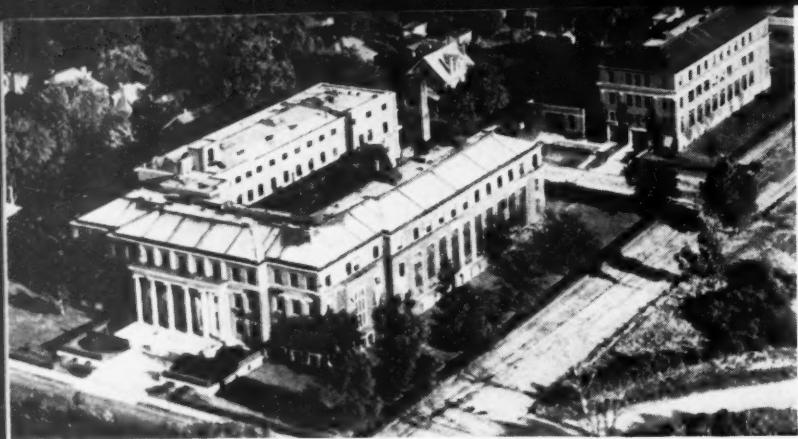
High porosity in a coal and a greed for oil go with high moisture content. No part of the coal substance is as active as fusain in absorbing oil, as may be shown by X-ray photographs. In 5 minutes, fusain will absorb as much lead-acetate solution as vitrain will absorb in 30 minutes.

The streamlined coal-burning space heater introduced by Battelle attracted much attention because of its modern appearance, smokeless operation, magazine feeding and automatic control. Its smokeless principle was developed under a joint sponsorship of the coal industry and 29 large stove manufacturing companies. The smokeless principle has been adapted to a room heater, to a heater with a separate heat exchanger and to a service water heater.

A million stoves are sold annually, so the new Battelle heater that meets the requirements of all smoke ordinances has large

possibilities, asserted Howard R. Limbacher. The first step in the program was the study of a conventional space heater to establish a yardstick for evaluation of other heaters, which later were investigated. The furnaces were placed on scales so that the rate at which fuel was consumed could be determined. Drafts and temperatures at various points, the carbon-dioxide content of the flue gases and smoke emission were measured and recorded. Smoke density was determined by photo-electric measurements. Tests were run continuously on a 24-hour basis with both high- and low-volatile coals. Under recent tests, using a strongly coking, high-volatile coal, the coal burned in the new heater produced no smoke at the time of firing and, over a 16-hour period, after firing, smoke density at no time exceeded No. 1 Ringelmann.

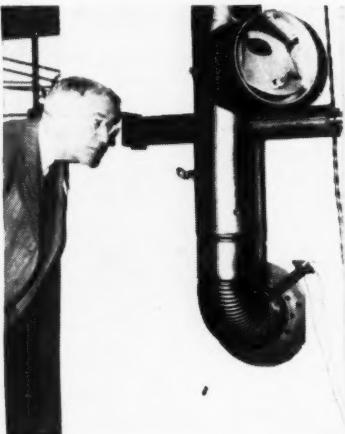
There are more ways than one of designing a completely automatic stoker, stated Mr. Sherman, who disclosed that a stoker in-



Battelle Memorial Institute, Columbus, Ohio.



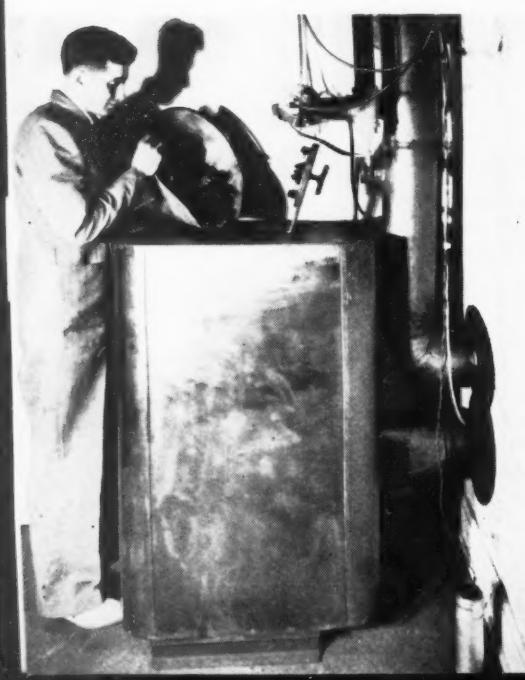
Cleanly magazine stove, developed at Battelle, makes heat without smoke.



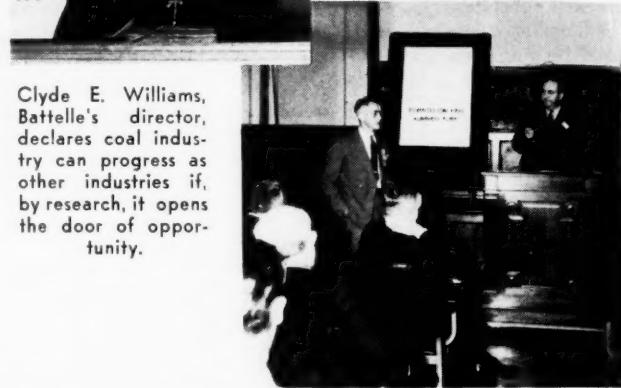
President H. N. Eavenson assures himself visually of the smokelessness of the new heater.



Forge furnace fired by pulverized coal.



Clyde E. Williams, Battelle's director, declares coal industry can progress as other industries if, by research, it opens the door of opportunity.



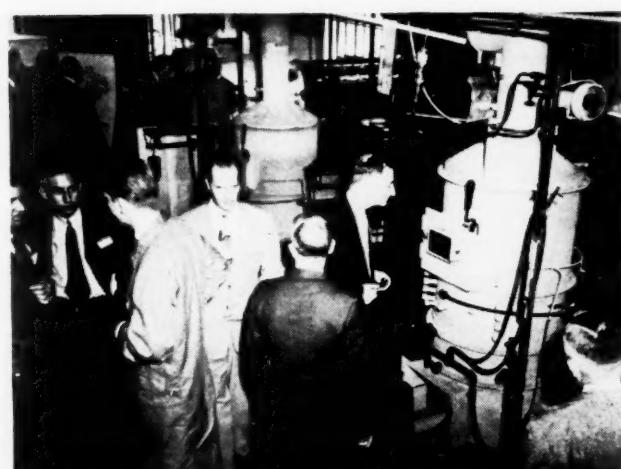
Coal executives and engineers listen with interest to expositions of new developments that will enlarge coal markets.



J. E. Butler, E. H. Davis, Jim Daniels, John D. Battle, A. W. Thorson and R. C. Rasmussen.



Midwestern delegates: Jonas Waffle, David Sherwood, R. H. Sherwood, and R. F. Wood recall with pride their advocacy of research for the coal industry.



E. S. Pugh, president, Lillybrook Coal Co., watches B. C. R. stoker burning, without coke-tree formation, a strongly coking coal.

Smokeless magazine heater with separate heat exchanger in adjoining room.

With J. E. Tobey at rostrum, R. A. Sherman answers a question on the dust-proofing of coal.

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July

corporating a revolving burnerhead in the center of an underfeed retort has been nearing perfection in the Battelle laboratories. Coal introduced into the ignition zone is agitated and concurrently sprayed with air to break up the coke as it forms and to consume its volatile matter. William B. Ramsdale discussed the merits of a second type of residential stoker which will handle difficult coals with automatic removal of ash. It has eight revolving concentric zones. Coal is delivered to the outer zone, and it is wiped by a deflector toward the center, where the ashes fall into a pit. The zones have an intermittent motion and this breaks up the coke as fast as it begins to form. The coal comes in at the level of the grate and is distributed in a thin layer by its action.

#### Pulverized Coal for Gas

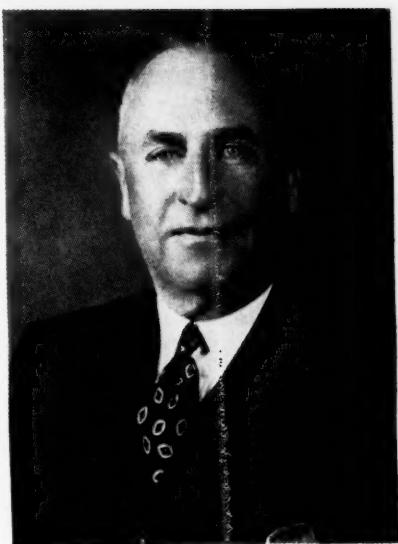
Because of the impending shortage of oil, Elmer R. Kaiser, Battelle engineer, has investigated the possibilities of using pulverized coal or producer gas to replace oil and natural gas in steel-making. To produce 80 million tons of steel a year, 16 million tons of coal would be needed. Pulverized coal can be used successfully to melt steel, but the heat regenerators must be redesigned so that they will handle the ash. The potential market for coal in the open-hearth industry is between 7,500,000 and 10,800,000 tons, depending on the fuel economy attained.

At one time, reported Richard B. Engdahl, Battelle engineer, the forging industry used hand-fired and pulverized coal for heating steel, but coal has been supplanted largely by oil and gas. Interest in the use of coal was revived when pulverized-coal burners were adapted by B.C.R. to a widely used standard type of small forge furnace, commonly fired with oil or gas. Both high- and low-volatile coals were burned, and the steel was heated to the satisfaction of a cooperating manufacturer who uses many such furnaces. A radiant tube furnace also is being investigated, for heating ware that must not come in contact with flame.

#### Pump Works on Coal

The Humphrey pump, designed in England and used with producer gas, is being adapted to pulverized coal, declared Bertrand A. Landry, assistant supervisor, Battelle's fuel division. The unit is an internal-combustion engine in which the water in a reciprocating water column acts as a piston to raise the rest of the water and to compress the air for the explosion. The diameter of the cylinder may be as much as 19 ft. The pump is ideally suited as an auxiliary at power dams, where, during periods of low water, it can be used to lift water for generating power.

Though bituminous coal is the food of the iron horse, the traditional motive power of the railroads, Mr. Sherman told the meeting, that of 985 new locomotives on order, May 1, only 408 are to be steam-driven. Coal supplies 85 percent of the energy for railroad transportation, taking a fifth of the coal mined, but the trend from the steam locomotive has been accelerating. The B.C.R. Technical Advisory Board has been apprised of plans for a new type of coal-burning locomotive that would be more smokeless, better able to burn the smaller sizes of coal and have a negligible stack cinder loss.



G. Donald Cowin Moffett

#### Hugh Murray Is Dead

Hugh Murray, 90, charter member of the Illinois Mining Institute and one of those responsible for its organization in 1892, died June 5 at his home in Equality, Ill. Born in Scotland, he attended Glasgow University, where he won the favor of Sir William Thompson, later Lord Kelvin, and was chosen to assist in some of his inventions. He revealed a canny mind when he told a worried Scottish colliery owner that his "poor" coal might be coking coal and a fortune rather than a failure. His surmise proved to be correct.

Coming to America in 1882, he conducted a school for mining engineers at Braceville, Ill. He later served twelve years on the Illinois State Mining Board, being appointed by Governor Tanner. He also was one of a committee appointed at the turn of the century to recodify the State mining laws.

Passing through zinc mining at Joplin, Mo., and coal mining near Ava and Sparta, Ill., he went to Equality in 1900. Here he managed a coal mine and one of the few coking plants to be built in southern Illinois. That mine was destroyed by an Ohio River flood in 1913.

G. DONALD COWIN, 54, president of the Bell & Zoller Coal & Mining Co. and the Crescent Mining Co., operating in southern Illinois, died June 14 after an illness of two weeks.

WILLIAM B. ROBINSON, 75, who helped found the P. V. & K. Coal Co., Harlan, Ky., some years ago and had been affiliated with it since, died June 14 after an illness of three weeks. He went to Harlan in 1919 from Pennsylvania, where he had been in the coal business, and was widely known in eastern Kentucky.

JAMES R. CASELEY, 60, president of the Buffalo & Susquehanna Coal & Coke Co., Sykesville, Pa., died June 12 at his home in DuBois, Pa., following a heart attack. A graduate of Purdue University in civil engineering, he served in that capacity for several years with midwestern railroads before joining the Buffalo & Susquehanna Coal & Coke Co.

C. H. MEAD, 63, president, Bellemead Coal Co., Sabine, W. Va., and also president and general manager of the Raven Cliff Development Co., which operates eleven oil wells in West Virginia, died June 28 in Miami, Fla., where he went last fall in hope of regaining his health. He was credited with organizing 17 coal-mining companies in West Virginia and is said to have been the first operator to ship coal from Wyoming County, in 1912.

#### Industrial Notes

LINK-BELT Co. has appointed Richard F. Bergmann as chief engineer with office at executive headquarters in Chicago. William W. Sayers, who has served in that capacity since 1925, has been named consulting engineer. In this newly created position he will continue to deal with patent matters and be available for consultation where his extensive knowledge of the company's engineering problems will be helpful.

B. F. GOODRICH Co., Akron, Ohio, has granted L. H. ("Larry") Chenowith, manager, manufacturers' sales, in the industrial products sales division, a leave of absence to serve in the Rubber Products Division of the War Production Board. He joined Goodrich in 1914 soon after graduation from Harvard University. While on leave his duties in the company's Washington office are being handled by I. N. KIMSEY, Akron district manager.

WATER TREATMENT CO. OF AMERICA, Pittsburgh, Pa., is broadening its sales and service facilities in western Pennsylvania, West Virginia, Ohio and Indiana through a distributorship arrangement with American Radiator & Standard Sanitary Corporation branches. Water Treatment Co.'s method of water conditioning for boilers, condensers, etc., known as the Technical System, will be sold and serviced by American Radiator & Standard Sanitary Corporation's branches in Akron, Canton, Cleveland, Columbus, Erie, Lima, Mansfield, Springfield and Toledo, Ohio; Fort Wayne, Ind., and Wheeling, W. Va.

AMERICAN BRAKE SHOE & FOUNDRY CO. has made William M. Black a vice president. He has been president of the American Manganese Steel Division of the American Brake Shoe & Foundry Co. since 1940 and will continue in that capacity.

ROBINS CONVEYING BELT CO., Passaic, N. J., announces that Maurice B. Bradley, since 1924 in charge of the company's Cleveland's branch office, is now in active service as a major in the Coast Artillery Corps of the U. S. Army. The Cleveland office will be under supervision of S. F. Knight, who also will continue in charge of the Detroit office.

#### Harrison Mine Resumes

Operations have been resumed by the Saxon Coal Co. at its Harrison mine, Que Creek, Somerset County, Pa., after having been closed for about eight years. A serious problem was the removal of water, after which track had to be relaid. Loading began on June 1, and the company expects to be working at normal rate soon.

## HELP FOR MINES SPEEDING UP DEFENSE PRODUCTION

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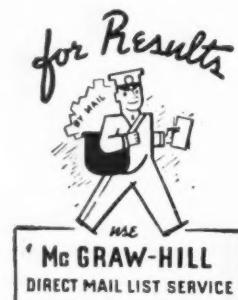
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### Bureau of Mines Reorganized With Regional Offices

Reorganization of the U. S. Bureau of Mines was announced by Dr. R. R. Sayers, Director, in accordance with an order signed June 15 by Secretary of the Interior H. L. Ickes. The new set-up is designed to "speed the movement of metallurgical processes" which have been worked out by the Bureau "from the laboratory and pilot-plant stage to commercial production."

The order sets up three regional offices to operate under Assistant Director R. S. Dean, who also will act as chief of a resources and laboratories service. The regional offices are: Western (including Alaska), Salt Lake City, in charge of S. R. Zimmerley; Central (including New Mexico and the Mississippi Valley as far east as Indiana and Kentucky), Rolla, Mo., in charge of E. D. Gardner; Eastern (including Mississippi, Tennessee and the Southern States), College Park, Md., in charge of S. M. Shelton.

The Technologic Branch and its divisions of mining, metallurgy and non-metals are abolished and most of their personnel is transferred to the Resources and Laboratory Service including C. F. Jackson as head mining engineer, C. W. Davis as principal metallurgical engineer, P. M. Ambros as principal engineer in charge of laboratories planning, O. C. Ralston as principal chemical engineer, and C. E. Julihn as principal mining engineer.

A Fuels and Explosives Service is established, to which the former Coal Division, Petroleum and Natural Gas Division, and Explosives Division are transferred. A. C. Fieldner was made head of the Fuels and Explosives Service and also its Solid Fuels Division, with W. C. Schroeder as Assistant

Chief. R. A. Cattell is Chief and H. C. Fowler Assistant Chief, Petroleum and Natural Gas Division, and W. J. Huff is consulting explosives chemist, Explosives Division. A. L. Toenges is principal coal mining engineer, Fuels and Explosives Service.

Laboratories and field offices working on coal at Golden, Colo.; Pittsburgh, Pa.; Bruceton, Pa. (including the Experimental Mine), and College Park, Md., and all field offices relating specifically to petroleum, helium and natural gas are placed under the Fuels and Explosives Service. The Health and Safety Service remains unchanged, with Dan Harrington as Chief.

### Coal-Mine Accident Fatality Rate Continues to Recede

Accidents at coal mines of the United States caused the deaths of 66 bituminous and 17 anthracite miners in April last, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

With a production of 49,000,000 net tons, the accident death rate among bituminous miners was 1.35 per million tons mined, compared with 2.34 in April, 1941.

The anthracite fatality rate from accidents in April last was 3.31, based on an output of 5,138,000 net tons, against 3.75 in the fourth month of 1941.

For the two industries combined, the accident fatality rate in April last was 1.53, compared with 2.83 in the corresponding month of last year.

Fatalities during April last, by causes and states, as well as comparable rates for the first four months of 1941 and 1942, are shown below:

DEATHS AND FATALITY RATES AT UNITED STATES COAL MINES, BY CAUSES OF ACCIDENTS\*

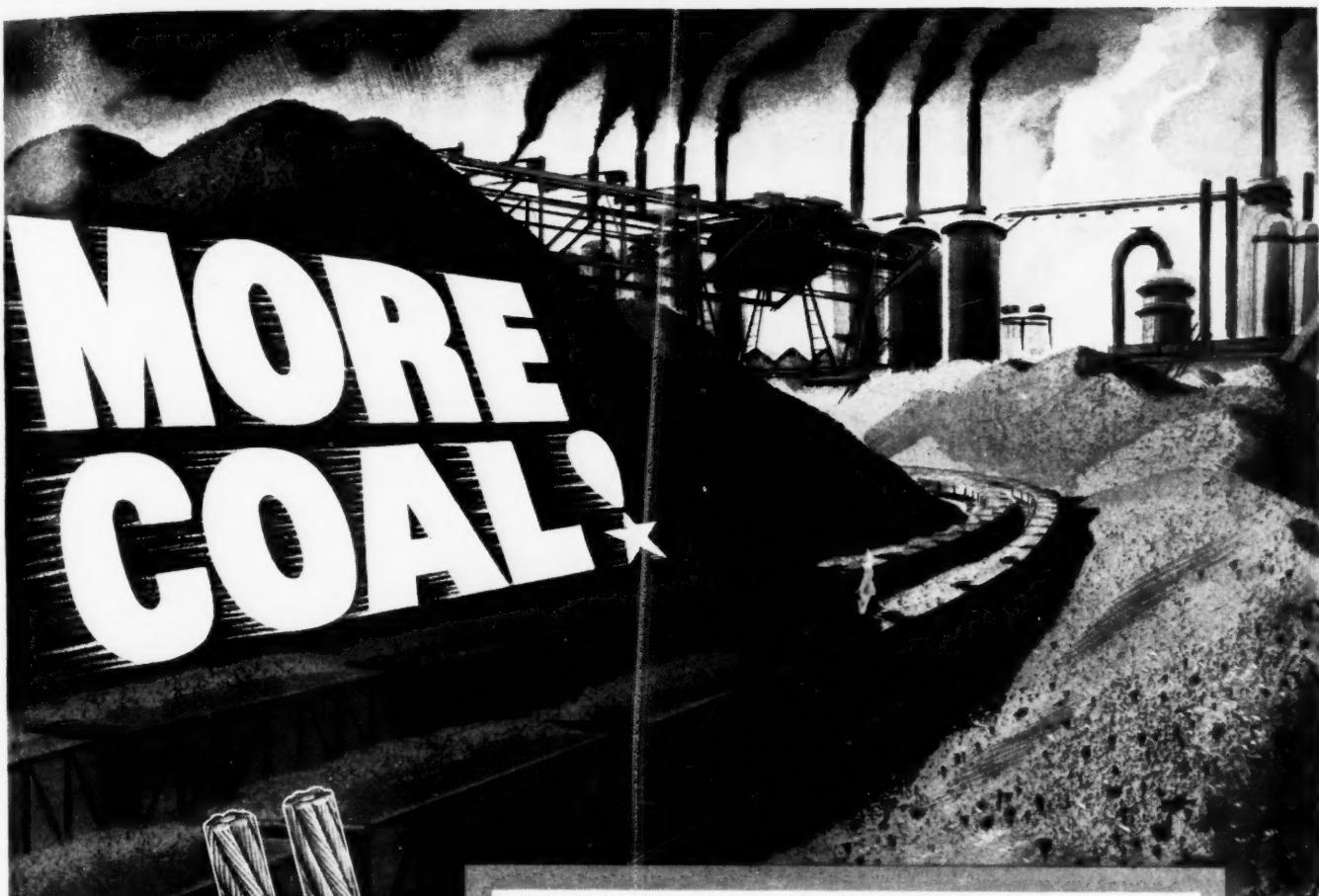
January-April, 1941 and 1942

Cause	Bituminous				Anthracite				Total			
	1941	1942	1941	1942	1941	1942	1941	1942	1941	1942	1941	1942
Underground:												
Falls of roof and coal	147	175	1,052	927	36	46	2,093	2,356	183	221	1,166	1,061
Haulage	53	64	.379	.339	10	8	.582	.410	63	72	.402	.346
Gas or dust explosions:												
Local	6	1	.043	.005	2	3	.116	.154	8	4	.051	.019
Major	6	34	.043	.180	—	—	—	—	6	34	.038	.163
Explosives	8	6	.057	.032	3	4	.174	.205	11	10	.070	.048
Electricity	7	9	.050	.048	1	2	.058	.102	8	11	.051	.053
Machinery	11	6	.079	.032	—	—	—	—	11	6	.070	.029
Shaft	2	3	.014	.016	1	2	.058	.102	3	5	.019	.024
Miscellaneous	—	7	—	.037	3	2	.174	.102	3	9	.019	.043
Stripping or open-cut	12	9	.086	.048	1	1	.058	.051	13	10	.083	.048
Surface	11	14	.079	.074	6	3	.349	.154	17	17	.108	.081
Grand total	263	328	1,882	1,738	63	71	3,662	3,636	326	399	2,077	1,915

\*All figures subject to revision.

UNITED STATES COAL-MINE FATALITIES IN APRIL, 1942, BY CAUSES AND STATES

State	Underground											Open-Cut	Surface	Grand Total
	Falls of Roof	Falls of Face	Haulage	Gas or Dust Explosions	Explosives	Electricity	Machinery	Other Causes	Total	Underground	Shaft			
Alabama	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Illinois	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Iowa	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Kentucky	—	—	—	—	—	—	—	—	—	—	—	—	—	—
New Mexico	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ohio	1	—	—	—	—	—	—	—	—	3	—	—	—	—
Oklahoma	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Pennsylvania (bituminous)	10	—	4	—	—	—	1	—	—	14	—	1	—	15
Tennessee	1	—	—	—	—	—	1	—	—	3	—	—	—	—
Virginia	1	—	—	—	—	—	—	—	—	2	—	—	—	—
Washington	—	—	—	—	—	—	—	—	—	1	—	—	—	—
West Virginia	13	1	5	—	—	—	—	3	22	—	—	3	25	—
Wyoming	1	—	—	—	—	—	—	—	—	1	—	—	—	—
Total bituminous	36	2	13	1	—	3	2	3	60	—	1	5	66	—
Pennsylvania (anthracite)	12	—	1	—	2	—	—	1	16	1	—	—	—	17
Grand total	48	2	14	1	2	3	2	4	76	1	1	5	83	—



# MORE COAL\*



Production is the watchword;  
More Production, the battle cry.  
No time for breakdowns, electrical or otherwise.

More valuable than ever are the  
inherent toughness and quality of

**SUPER SERVICE\***  
**PORTABLE MINING CABLE**

\*Trade-mark

# GENERAL CABLE

BARE and INSULATED WIRES and CABLES for EVERY ELECTRICAL PURPOSE

General Cable Corporation Sales Offices: ATLANTA • BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DETROIT • HOUSTON  
KANSAS CITY (MO.) • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • ROME (N.Y.) • ST. LOUIS • SAN FRANCISCO • SEATTLE • WASHINGTON (D.C.)

U. S., Soviet Agree

Germans Claim So

# a 75-ton kick in the panzers!



Confidence is the strong and good cousin of that horrid word complacency. Most Americans are confident, few are complacent today. Confidence is our heritage, bequeathed to us by the pioneers, and nurtured by headlines of industrial marvels.

From the day when the Flatiron Building made news, to the colossal statistics of Grand Coulee, we have become firmly convinced that no task is too great for our vast construction industry.

That conviction is justified. A year before Pearl Harbor Sunday was anything more than a gleam in treacherous oriental eyes, our engineers and contractors were moving earth faster than it had ever been moved before . . . in preparation for projects which since have made our skyscrapers and giant bridges look like mere trial heats.

You know part of the story. We can't tell it all . . . complete aluminum plants built between Christmases . . . whole farms transfigured into bomber plants in less time than elapses between crops of corn . . . great shipyards in operation today on inlets that were frog ponds when the "Battle of Britain" was at its height.

How were these miracles of construction performed?

We can't call it genius. Germany, in particular, has many great engineering minds, yet the entire Axis is outstripped by our capacity to do big jobs fast.

We can't explain it by just calling it skill and experience. The new shipyards prove that . . . our skilled and experienced shipbuilders were absorbed by navy construction long ago. Yet we have met each new quota of cargo shipbuilding. Deep in our hearts we all know industry

will meet whatever quota may be needed however impossible that may seem now.

► Some of these cargo ships and shipyards are being built by landlubbers . . . by men who knew nothing of the sea, but who were hell on reading blueprints and at designing and operating complicated machines.

There are several reasons why ordinary Americans become Supermen when faced by "fantastic" construction jobs.

► The first reason is the intrepid spirit of the management and men of American construction. With a slide rule in his hand, the most meek and stoop-shouldered of American engineers becomes a high adventurer. He is willing to gamble that the machines and men at his command can lick anything this side of the fourth dimension.

The second reason is motive power. The leaders of our construction industry have always had the guts to gamble the cost of big machines to do big jobs. Probably the rest of the world combined cannot match our array of power shovels, scrapers, bulldozers, compressors, welders, motors and engines for moving and moulding earth, water, steel and stone.

The third reason is men. A shovel weighing 75 tons needs a "75-ton mind" at the control levers . . . American labor takes to machinery as a co-ed takes to "swing."

The fourth reason is versatility. The construction industry is used to turning corners at high speed . . . to an organization that has built railroads, cathedrals, bridges, and movie palaces, making a munitions plant in a hurry just means more men, more machines and more night work, and more of that good American ingenuity.

In recognition of the miracle of war production accomplished through the cooperation of American management and labor with the W. P. B. . . . this advertisement is published by the McGraw-Hill Network of Industrial Communication.

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# *PS.* The fifth reason is "mobilized information"

**T**hrough a distinctively American process, the Industrial Press, trial and error are reduced to a minimum. Information on successful new techniques flows freely from job to job.

If a factory in Kansas succeeds in laying the dust and stopping ruts in its parking lot, an engineer with the job of quick-surfacing a jungle airport reads how it was done in a construction magazine.

If a shipbuilder finds he can cut construction time in half by building hulls upside down, other shipbuilders learn about it from their technical magazines.

*At McGraw-Hill alone 153 editors and 725 field-correspondents are constantly combing construction as well as industrial jobs to find new and faster methods. This "know-how" is then routed through industrial magazines to every industry where it can be helpful.*

In addition to the editors, many industrial advertisers keep men in the construction field to watch the performance of their machines. Their reports are used in industrial advertising to show operators how to make machines do

more work and last longer in these days of shortages of time and metal.

... Now this advertisement contains a moral and "commercial." The commercial objective is obvious. The moral is this:

► Let's remember how well government, management and labor are getting along together in the face of visible peril. When the war is all over, we need have no fear of the invisible perils of peace, if we tackle our jobs in the same cooperative spirit.

## THE McGRAW-HILL NETWORK

More than 1,000,000 of the executives, designers and production men, who give America her world supremacy in technical "know-how," use the editorial and advertising content of the 23 McGraw-Hill publications as a means of exchanging ideas.

## McGRAW-HILL BOOKS

Publishers of technical, engineering and business books for colleges, schools, and for business and industrial use.

**McGRAW-HILL PUBLISHING COMPANY, INC.**  
330 WEST 42nd STREET • NEW YORK

## THE McGRAW-HILL NETWORK OF INDUSTRIAL PUBLICATIONS

American Machinist

Aviation

Bus Transportation

Business Week

Chemical & Metallurgical  
Engineering

Coal Age

Construction Methods

Electrical Contracting

Electrical Merchandising

Electrical West

Electrical World

Electronics

Engineering & Mining Journal

E. & M. J. Metal and Mineral Markets

Engineering News-Record

Factory Management & Maintenance

Food Industries

Mill Supplies

Power

Product Engineering

Textile World

Transit Journal

Wholesaler's Salesman

LIMA TYPE 1201 OWNED BY THE MARSHALL MINING CO., YOUNGSTOWN, OHIO. THE SHOVEL IS EQUIPPED WITH A 42' BOOM, 32' DIPPER HANDLE AND A 2 1/2 YARD DIPPER.



## LIMA'S DEPENDABLE PERFORMANCE HELPS TO INCREASE OUTPUT

LIMA shovels and draglines serving the coal mining industry are providing the long, dependable and efficient service so desirable in well operated and successful open-pit mines. The features that make LIMA shovels and draglines so satisfactory and profitable include . . . Helical Cut Gears for quiet, smooth operation . . . Anti-friction Bearings at every important bearing point for greater power and efficiency . . . Large Diameter Drums for longest possible cable life . . . Independent Clutches which make it possible to hoist, swing, travel and boom up or down simultaneously . . . Fast, Mobile Crawlers which make difficult traveling easy. These features and many more mean fewer delays, steadier production and greater dollar value.

LIMA LOCOMOTIVE WORKS  
INCORPORATED

Shovel and Crane Division

LIMA, OHIO

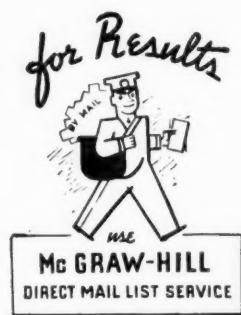
# LIMA

## WHAT MAKES A MAILING CLICK?

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DIRECT MAIL DIVISION  
McGraw-Hill Publishing Company, Inc.  
330 WEST 42nd ST. NEW YORK, N.Y.

## The greatest help a coal mining man can have—

IF YOU want to make sure of getting your certificate of competency—sure of winning a bigger job with bigger pay, get Beard's great books today and put them to work for you.

In these three books you have a practical, always-on-the-job guide that will help you solve the problems you face every day, show you what to do, tell you why it should be done.

## Beard's Mine Examination Questions and Answers!

3 volumes—\$7.50, payable in four monthly payments

THESE books explain what a man must know in order to become a mine inspector, a mine foreman, assistant foreman, fireboss, hoisting engineer, safety engineer, shot-firer, etc. They give you complete and authoritative information about air and gases, explosives, safety requirements and methods, mechanics, engines, hoisting, drainage, pumping, ventilation, timbering, instruments, and every other detail that the practical mining man must know.

### Can you answer these questions—

What is meant by splitting the air current and what are the advantages derived from such methods?

Can a miner live in air in which the oxygen content is reduced to 17 per cent?

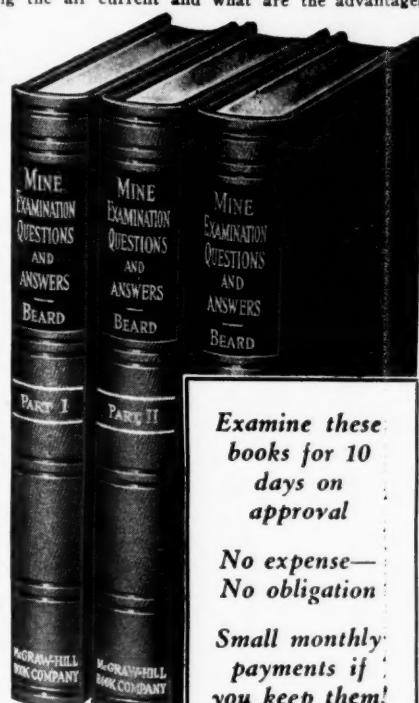
Name five duties imposed on mine foremen by law?

In what time can an engine of 40 effective hp. pump 4,000 cu. ft. of water from a shaft 360 feet deep?

What are the advantages and disadvantages of a gasoline pump, an air pump and an electrical pump?

What is the estimated tonnage per acre, per foot of thickness, for bituminous coal?

These are but a few of the more than 2000 questions given in Beard's books together with full correct answers. Hundreds of men have used this method to prepare for higher, better jobs. You can too, if you have the Beard books and plan to use them systematically. They are the best investment that a mining man can make—not only as an aid for passing examinations but as practical reference volumes on everyday mining operations.



### McGRAW-HILL ON-APPROVAL COUPON

McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York

Send me, charges prepaid, Beard's Mine Examination Questions and Answers, 3 volumes, for 10 days' examination. If satisfactory I will pay \$7.50 at the rate of \$1.50 in ten days and \$2.00 per month. If not wanted I will return the three volumes postpaid.

Signature \_\_\_\_\_  
Address \_\_\_\_\_  
City and State \_\_\_\_\_  
Company \_\_\_\_\_  
Position \_\_\_\_\_ C. 7-42

They Cut  
Through  
Foreign  
Matter

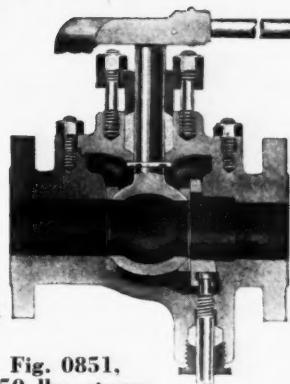


Fig. 0851,  
250 lbs. steam  
pressure

The shearing action of the rotating ball plug in Sphero Valves cuts through scale or thick viscous materials as it revolves when opening or closing. This, and the perfect seating of the ball, assures a tight, leak-proof seal.

The round portway in the plug gives an opening the same size as in the pipe and reduces pressure loss.

Wear on the seat rings is reduced to a minimum by the rotary movement of the ball because they are not in contact with the flow when valve is wide open or closed.

Fairbanks Sphero Valves are easier and quicker to operate. Working parts can be renewed on the line.

Other features which recommend them for blow-off purposes and services where a full flow, quick-acting valve is required, are explained in catalog No. 21. Write for a copy.

### The FAIRBANKS COMPANY

Valves, Dart Unions, Hand Trucks,  
Truck Casters

388 Lafayette St., New York, N. Y.

Boston, Mass., Pittsburgh, Pa.—Distributors in  
Principal Cities



**Fairbanks Sphero  
Valves**



## New Target for Industry: More Dollars Per Man Per Month in the PAY-ROLL WAR SAVINGS PLAN



TO WIN THIS WAR, more and more billions are needed and needed fast—AT LEAST A BILLION DOLLARS A MONTH IN WAR BOND SALES ALONE!

This means a *minimum* of 10 percent of the gross pay roll invested in War Bonds in every plant, office, firm, and factory in the land.

Best and quickest way to raise this money—and at the same time to “brake” inflation—is by stepping up the Pay-Roll War Savings Plan, having every company offer every worker the chance to buy MORE BONDS.

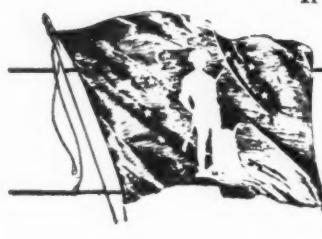
Truly, in this War of Survival, VICTORY BEGINS AT THE PAY WINDOW.

If your firm has already installed the

Pay-Roll War Savings Plan, *now is the time*—

1. To secure wider employee participation.
2. To encourage employees to increase the amount of their allotments for Bonds, to an average of at least 10 percent of earnings—because “token” payments will not win this war any more than “token” resistance will keep the enemy from our shores, our homes.

If your firm has not already installed the Pay-Roll War Savings Plan, *now is the time to do so*. For full details, plus samples of result-getting literature and promotional helps, write, wire, or phone: War Savings Staff, Section E, Treasury Department, 709 Twelfth Street NW, Washington, D. C.



## U. S. War Savings Bonds

This space is a contribution to America's all-out war program by

COAL AGE

Form No. WSS-BP-5

16-28448-1 U. S. GOVERNMENT PRINTING OFFICE

**BELT LACING  
and FASTENERS**  
for transmission  
and  
conveyor belts



**ALLIGATOR**  
Trade Mark Reg. U. S. Pat. Office

**STEEL BELT LACING**

World famous in general service for strength and long life. A flexible steel-hinged joint, smooth on both sides. 12 sizes. Made in

steel, "Monel Metal" and non-magnetic alloys. Long lengths supplied if needed. Bulletin A-60 gives complete details.

**FLEXCO HD**

**BELT FASTENERS AND RIP PLATES**

For conveyor and elevator belts of all thicknesses, makes a tight butt joint of great strength and durability. Compreses belt ends between toothed cupped plates. Templates and FLEXCO Clips speed application. 6 sizes. Made in steel, "Monel Metal", non-

magnetic and abrasion resisting alloys.

By using Flexco HD Rip Plates, damaged conveyor belting can be returned to satisfactory service. The extra length gives a long grip on edges of rip or patch. Flexco Tools and Rip Plate Tool are used. For complete information ask for Bulletin F-100.

Sold by supply houses  
everywhere

**FLEXIBLE STEEL  
LACING CO.**

4638 Lexington St.  
Chicago, Ill.



"CONVEYOR BELTS EASILY FASTENED!"

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for Results



**Mc GRAW-HILL  
DIRECT MAIL LIST SERVICE**

**DIRECT MAIL DIVISION**  
**McGraw-Hill Publishing Company, Inc.**  
330 WEST 42nd ST. NEW YORK, N. Y.

ARE YOU USING COMPOUND "M" IN THE MINE?

**Caladd**



Dustless Treatment for Coal



**Assures an uninterrupted supply  
of permanently dustless coal**

The use of Coaladd for many years, by numerous producers, has proven the value and economy of this permanent dustless treatment for coal.

It is the one treatment that combines all the good factors of both oil and calcium chloride, with none of the detrimental factors of either, plus all the following advantages.

1. **PERMANENT DUSTPROOFING**—Coaladd keeps coal dustproofed until used.
2. **NO ODOR**—There is no odor from Coaladd treatment, either when the coal is stored or burned.
3. **NO STAINS**—Coaladd treatment is clean, does not stain the floor, will not track.
4. **SAFE**—No fire hazards are added or created when Coaladd is used.
5. **HARMLESS TO METALS AND RUBBER BELTING**—Coaladd by test, and experience from long usage, is less corrosive than ordinary water.
6. **FORMS PROTECTIVE FILM**—Coaladd forms a permanent protective over each coal particle. This film agglutinates the fine dust.
7. **IMPROVED APPEARANCE**—The Coaladd film improves the appearance of the coal.
8. **ECONOMICAL**—Coaladd is used in less than half the quantity of any other chemical treatment.
9. **TREAT WET COAL**—Coaladd can be applied dry on wet coal. It will form a solution with the water on the coal itself.
10. **PROTECTS STORED COAL**—Coaladd treatment protects stored coal against change of rank. It reduces degradation and retards segregation of fines. It minimizes the danger of spontaneous combustion.

Coaladd is the only material that fulfills all the requirements of the producer, dealer and ultimate consumer. Ask for complete details.

A Product of

**THE JOHNSON-MARCH CORPORATION**

52 VANDERBILT AVENUE NEW YORK, N. Y.

ARE YOU USING COMPOUND "M" IN THE MINE?

# MORROW

MANUFACTURING CO. WELLSTON, OHIO

DESIGNERS AND BUILDERS OF COAL HANDLING EQUIPMENT FOR OVER 25 YEARS

Shaking Screens

Coal Washers

Car Hauls, Picking Tables

Loading Booms, Loading Chutes

Bins, Bin Gates

## COMPLETE COAL TIPPLES AND COAL HANDLING EQUIPMENT

Elevating and Conveying Machinery

Sand and Gravel Screening and Washing Machinery

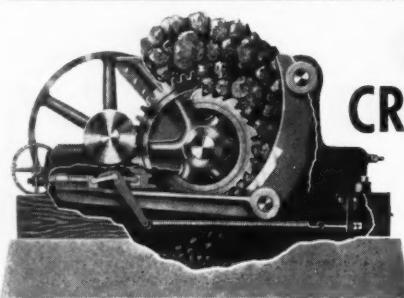
Car Retarders

Settling Tank, Grizzlies

Revolving Screens

Perforated Metal Screens

Flanged Lip Screen Plates



## COAL CRUSHERS

We build a type and size for every coal crushing requirement. 100 years of experience is your assurance that we know how. Quotations on request.

**McLANAHAN & STONE CORP**

Established 1835

HOLIDAYSBURG, PENNA.

## PERFORATED METAL COAL MINING SCREENS

Manufactured exactly to your specifications  
Any size or style screen, in thickness of steel  
wanted with any size perforation desired.  
We can promptly duplicate your present screens at lowest prices.

CHICAGO PERFORATING CO.  
2443 West 24th Place  
CHICAGO, ILLINOIS  
Canal 1459

**HENDRICK**  
Carbondale 1600  
for  
**PERFORATED PLATE**

Round—Square—Diagonal—Slot  
Any perforation

**HENDRICK MANUFACTURING CO.**  
41 DUNDAFF ST., CARBONDALE, PA.

Sales Offices in Principal Cities.  
Please Consult Telephone Directory.

**ARMSTRONG-BRAY**  
**STEELGRIP**  
FLEXIBLE BELT LACING

8 sizes. Boxed or in long lengths for wide conveyor belts. Easily applied anywhere with a hammer, it compresses belt ends and prevents fraying. 2-piece hinged rocker pin takes up wear. Immediate delivery. Write for Catalog showing most complete line of belt lacing manufactured.

**ARMSTRONG-BRAY & CO.**  
5342 NORTHWEST HIGHWAY  
CHICAGO, U.S.A.



## NATIONAL Classified Advertising —at your service

for bringing business needs or "opportunities" to the attention of men associated in administrative, executive, management, sales and responsible technical, engineering and operating capacities with the industries served by McGraw-Hill publications:

### The SEARCHLIGHT SECTIONS

*(Classified Advertising)*

American Machinist  
Aviation  
Bus Transportation  
Business Week  
Chemical and Metallurgical  
Engineering  
Coal Age  
Construction Methods  
Electrical Contracting  
Electrical Merchandising  
Electrical World  
Electronics

Engineering News-Record  
Engineering and Mining  
Journal  
E & M J Markets  
Factory Management and  
Maintenance  
Food Industries  
Power  
Product Engineering  
Textile World  
Transit Journal

For advertising rates or other information address the  
Departmental Staff

**McGRAW-HILL PUBLICATIONS**

330 W. 42nd St., New York, N. Y.

# SEARCHLIGHT SECTION

## EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

### UNDISPLAYED RATE:

10 cents a word, minimum charge \$2.00.  
(See **4** on Box Numbers.)

**POSITIONS WANTED** (full or part-time salaried employment only),  $\frac{1}{2}$  the above rates.  
**PROPOSALS**, 50 cents a line an insertion.

**NEW ADVERTISEMENTS** received by 10 A. M. July 27th will appear in the August issue, subject to limitations of space available.

### POSITIONS WANTED

**CIVIL AND MINING ENGINEER** wishes connection with Progressive company, can take full charge of Engineering and Production Departments. 24 years practical experience Anthracite, Bituminous Foreman Certificates. Married, age 44 years. References, PW-619, Coal Age, 330 W. 42nd St., New York, N. Y.

**ENGINEER, ATTORNEY**—wish executive position with mining company. Experience, 25 years Chief Engineer, Superintendent, mine examinations, reports, construction, shaft sinking, drilling, mechanical loading, conveying, coal washing, coking, power plants, legal, engineering, operating and executive problems, large coal, iron, non-metal plants. PW-622, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

**ACCOUNTANT**—College Trained—Married. Familiar with all phases of the work as outlined by the U. S. Department of the Interior, requiring special work for the Bituminous Industry, preparation of balance sheets, etc. References furnished, PW-633, Coal Age, 330 W. 42nd St., New York, N. Y.

**WANTED POSITION** as Chief Clerk or Assistant Chief Clerk in mine office. Nineteen years with one concern, eleven years as Chief Clerk. Age 39—Married—available at once. T. B. Feagans, Highcoal, West Virginia.

**SUPERINTENDENT, ENGINEER**—technical graduate, 22 years experience as superintendent, chief engineer, safety engineer, construction, shaft sinking, mechanization, coal washing. Similar position wanted. PW-634, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

**ENGINEER**—Superintendent desires change with bituminous mining company. 26 years experience, Beet, Chain and Shaker experience. Southern interview. References, PW-636, Coal Age, 330 W. 42nd St., New York, N. Y.

### BUSINESS OPPORTUNITIES

#### Strip Coal

20 ACRES Pittsburgh seam coal  $1\frac{1}{2}$  miles from R.R. Cover averages 15 feet. Very reasonable. BO-616, Coal Age, 330 W. 42nd St., New York, N. Y.

#### Coal Mine

High grade coal big vein suitable for domestic use 14,000 ton units waterless. Entry will store. Need money for trip. Will consider any proposition. Contact Marion Posig, Oak Creek, Colorado.

#### Rail-River Coal Mines

In midwest available on lease basis. Address BO-628, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

#### FOR LEASE

FOR LEASE: 3200 acres 6 foot  $\pm 5$  coal for underground Mining and 2800 acres strip coal 4 foot 2 inches  $\pm 5$  seam. Plenty of water available. New York Central railway and Southern Indiana Gas & Electric Company power line on these lands. We deal with operators only. J. R. Wasson, Boonville, Indiana.

#### FOR SALE

JOY LOADER, Bradford Breaker Outfit. Four 12 Cubic Yard Sidedump Railroad Cars. Two Skins or Cages, Hoisting Engines, Steel Head-frame with Sheaves. FS-627, Coal Age.

#### WANTED

WANT TO BUY small operating coal mine. Give full particulars. W-635, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

ANYTHING within reason that is wanted in the field served by Coal Age can be quickly located through bringing it to the attention of the thousands of men whose interest is assured because this is the business paper they read.

### INFORMATION:

**BOX NUMBERS** in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.

**DISCOUNT** of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

### DISPLAYED—RATE PER INCH:

The advertising rate is \$6.30 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

**AN ADVERTISING INCH** is measured  $\frac{1}{8}$  inch vertically on one column, 3 columns—30 inches —to a page. C.A.



### WE LOOK INTO THE EARTH

By using Diamond Core Drills, We drill for Limestone, Gypsum, Talc, Fire Clay, Coal and all other minerals. **PENNSYLVANIA DRILLING CO.** Drilling Contractors Pittsburgh, Pa.

**DIAMOND CORE DRILLING**, for any mineral. More than sixty gasoline, steam and electric drills, suitable for any job. **OUR SPECIALTY**—testing bituminous coal lands. Satisfactory cores guaranteed. Prices very reasonable.

**HOFFMAN BROS. DRILLING CO.** PUNXSUTAWNEY, PA. Est. 1902 Tel. 332

## WANTED

### —TRANSFORMERS—



### TRANSFORMERS WANTED

in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

We Rewind, Repair and Redesign all Makes and Sizes  
ALL TRANSFORMERS GUARANTEED FOR ONE YEAR

Write for Catalog No. 136-B

### THE ELECTRIC SERVICE CO., INC.

"AMERICA'S USED TRANSFORMER CLEARING HOUSE"  
STATION M Since 1912 CINCINNATI, OHIO

### WANT TO BUY

(OF COURSE, WE SELL, TOO!)

STEEL LOCKERS—Give sizes, make, number, etc.

OFFICE FURNITURE, OFFICE EQUIPMENT, BUSINESS MACHINES, give serial numbers, general descriptions.

SAFES—Cabinet, Underwriters' Label.

VISIBLE EQUIPMENT, such as Kardex, Acme, etc.—Note number of drawers, size of cards, etc.

ADDRESSOGRAPH EQUIPMENT, FRAMES, TRAYS, CABINETS, MACHINES, etc.

Give best prices "as is", f.o.b. point of purchase. May I hear from you.

PHONE, WIRE OR WRITE

### J. E. MURPHEY

Chestnut 9000 1800 Dyer St. Louis County, Mo.

Oldest exclusive used office equipment dealer west of Mississippi Keep This Advertisement for Future Reference

"Never say fail - - - AMERICA!"

### WANT TO BUY:

- 1—Jeffrey L-400 Loading Machine
- 1—Jeffrey 29-U Cutting Machine

### FOR SALE:

- 3—Sullivan CE-7 Shortwalls
- 2—Jeffrey A-6 Post Drills

### BATON COAL CO.

1100 Union Trust Bldg.

PITTSBURGH, PENNSYLVANIA

### WANT TO BUY

1 to 6 Tyler or Hummer Vibrating Screens.

1-30x30 or 2 smaller roll type Coal Crushers.

1-200 to 300 KW M.G. Set.

1-50 to 60 Ton Locomotive.

20 Ton or Larger Locomotive Crane.

1-Rotary Dryer 5x60 or equal.

2-1300' or equal air compressors.

### RUSSELL STANHOPE

60 East 42nd Street New York, N. Y.

Address copy to the Departmental Staff

COAL AGE

330 West 42d St., New York City

NEW "SEARCHLIGHT" ADVERTISEMENTS received by July 27th, will appear in the August issue, subject to limitations of space available.

Address copy to the Departmental Staff

## SEARCHLIGHT SECTION

### 6 YD. STRIPPER SHOVEL

200-B Bucyrus 6 years old. 75 ft. Boom, 60 ft. Dipper stick, 6 yd. Dipper Steam Shovel.

**SHOVEL & DRAGLINE:**  
4 yd. 120-B Bucyrus Electric Shovel & 100 ft. boom. Dragline.  
2½ yd. 100-B Elec. Shovel.

### DIESEL DRAGLINES

3W 4W & 5W Monighan Walkers, 90 to 110 ft. booms.  
3 Yd. P.G.H. 900, 97' boom.  
2½ Yd. 48B Bucyrus 80' boom.  
2 Yd. 750 Lima, 60' boom.

**AIR COMPRESSORS:**  
(7) Steam 66 ft., 300 ft., 600, 1000 & 1940 ft. (12") Belted, 360, 676, 870, 1000, 1300 ft.  
(12) Diesel 105, 315, 520, 676 & 1000 ft.  
(6) Electric, 1300, 1500, 2200, 2600, 5000 ft.  
(14) Gasoline, 110, 160, 220, 310 & 370 ft.

### COAL CRUSHERS:

Jeffrey Single Roll 18x18, 24x24 & 30x30 Link Belt 26x24 Double Roll Crusher

**HYDRAULIC CARWHEEL PRESSES:**  
100 Ton, 150 Ton, 300 Ton, 300 & 400 Ton Caldwell Niles - Wood - Watson Stillman

**RUBBER CONVEYOR BELTS:**  
1000' 60", 600' 30", 300' 20", 1600' 42", 900' 48", 1450' 36", 1200' 24", 900' 18", 600' 16", 350' 14".

**CONVEYOR PARTS:**  
Idlers, Head & Tail Pulleys, Steel Frames, Trip-  
per, etc., 14 In., 60 In. Large Stock here.

**SYNC. MOTOR GENERATORS & ROTARY:**  
100 KW Ridgway 1200 RPM 3/60/2300/250-275  
150 KW G.E. 1200 RPM 3/60/2200-250-275  
200 KW Ridgway 900 RPM 3/60/2200-250-275  
3-100 KW G.E. 275 v. 1200 RPM Rotaries

**STORAGE BATTERY LOCOMOTIVES:**  
2½ ton Whitcomb 24 ga. New Batteries

2-4 ton G.E. 30 in. ga.  
3-5 ton Mancha 30 in. ga.

4-5 ton G.E. 36 in. ga.  
3-7 ton Goodman 36 ga. Battery & Trolley

8-6 ton Baldwin Westing. 42 ga. & 36 ga.

### TROLLEY LOCOMOTIVES:

2½ ton Westinghouse 24 ga.

4-6 ton & 3-5 ton Goodman 36 ga.

3-5 ton Goodman 36 ga.

4-6 ton Goodman 42 ga.

5-6 ton Westinghouse 42 ga.

2-8 ton Goodman 36 ga.

10 ton Goodman 42 ga. & 13 ton Jeffrey

### VIBRATING SCREENS:

9 Tyler Hammer 3x6, 4x5, 4x8 & 4x10

2 Robins Gyrex 4x8½

4x12 Niagara, 3x8 L. B., 5x6 Simplex

### CARS:

120-4 ton 42 ga. S.D. Mine Cars

60-Western 16 20-30 yd. Side Dump

**SHOVELS, CRANES & DRAGLINES:**

3 W 90' Boom, 6 W 160' Boom, Model 6150, 175' Boom Diesel. Monighan Walkers

1 yd. K 30' Link Belt 60' Boom Crane

2 yd. K 30' Link Belt Diesel Dragline

1½ yd. Marlon 450 Elec. Shovel

2 yd. Link Belt Elec. Shovel & Dragline

25 ton Browning 50' Boom Loco. Crane

7 Conway 20A, 30A, 50A, 60 & 75 Muckers

### MINE LOADERS:

Junior Joy 36 ga. Low Pan

Conway 20 Mucker

3-5 BU & 7 BU 36 or 42 ga. Joy

9-Goodman 260 & Jeffrey 44L

### MISCELLANEOUS

5'x160' Traylor Rotary Dryer

100 HP G.E. 3/60/440 v. 900 RPM Elec. Motor

6 Goodman 12CA & 12 DA 6 ft. Cutters

9x8 Sullivan Mine Compressors

Clamshell Buckets ¾, 1, 1½ & 2 yd. Cap.

30 ton & 12 ton Vulcan Std. Ga. Gas. Loco.

### WANTED TO BUY:

Complete Mines—M.G. Sets, Locomotives, Com-  
pressors, Conveyors, Cranes, Crushers & Rotary  
Converters. Also Rails, Screens, Pumps, Cars,  
Mine Loaders & Mining Machines.

**Tidewater Equip. & Machy. Corp.**  
305 Madison Ave. New York, N. Y.

NEW and REBUILT  
STORAGE BATTERY

### LOCOMOTIVES

1½ to 10 Ton—18" to 56" Track Gauge  
GREENSBURG MACHINE CO.  
Greensburg, Penna.

### High Grade Maintenance Machine Tools

Lathes, Shapers, Milling Machines, Hy-  
draulic Presses, Hack saws, every type  
of tool for the maintenance shop. Write  
for catalogue.

**Cincinnati Machinery & Supply Co.**  
217 E. Second St. Cincinnati, Ohio

## FOR SALE

### LOCOMOTIVES

15-6-ton Gathering Locomotives, G. E., Jeffrey and Goodman.  
7-8-ton Locomotives, G. E., Westinghouse, house and Jeffrey.

5-10-ton Locomotives, General Electric, Goodman and Jeffrey.

4-15-ton Locomotives, Westinghouse, General Electric and Jeffrey.

The above locomotives are completely rebuilt—36" to 48" gauge.

### ROTARY CONVERTERS

2-300 KW G. E. Synchronous Rotary Converters, type HCC-6, form P, 1200 RPM, 250/275 volt DC, switchboards and all necessary switchgear, including 2300 volt transformers.

### BELT CONVEYORS

1-Goodman type 97-30, 30" Belt Conveyor, 1000' centers, 121 intermediate sections.  
1-Goodman type 97-30, 30" belt conveyor, 959' centers, 117 intermediate sections. Practically new.

### LOADING MACHINES

15-5-BU Joy Loading Machines. Perfect operating condition.  
15-G-20 Goodman Automatic Duck Bills. Practically new.

### MINING MACHINES

25-Sullivan CE-7 AC, 220/440 volt. Just taken out of service. Excellent condition.

### SEVERAL SHAFT AND SLOPE HOISTS

From 300 to 1300 H.P.

We Specialize in Buying Complete Mines That Are Going Out of Business or From Receivers in Bankruptcy, Administrators of Estates, Etc.

OUR FINANCIAL RESPONSIBILITY IS YOUR GUARANTEE OF SATISFACTION!

**COAL MINE EQUIPMENT SALES COMPANY**  
306-7 Beasley Building L. D. Phone 34 Terre Haute, Indiana



Frank J. Wolfe

## PIPE—MACHINERY—GAS ENGINES AIR COMPRESSORS—DIESELS—PUMPS

Some Steam Engines and Boilers available only slightly above the metal price

**BRADFORD SUPPLY COMPANY**  
WAYNE, WOOD COUNTY, OHIO

Near Toledo

### IRON and STEEL PIPE

#### New and Used

Large stocks, all sizes  
attractive prices

**L. B. FOSTER COMPANY, Inc.**  
P. O. Box 1647 Pittsburgh, Pa.

### New and Guaranteed Tested Reconditioned

### STEEL PIPE AND BOILER TUBES

In Light Weight, Standard or Heavy

**Jos. Greenspon's Son Pipe Corp.**

NAT'L STOCK YDS (ST CLAIR CO) ILL.

### 2—G.E. 150 KW Syn. M.G. Sets

2-150 KW 275 v. G.E. Type MPC 1200 RPM  
cp. wd. int. dir. con. 225 HP G.E. Type ATI  
8 P.F. 2300/3/60 1200 RPM Syn. Motors with  
AC and DC Manually operated switchboards.

Also 100 KW West. Syn. Set, same characteristics  
as above.

**Moorhead-Reimeyer Co. Inc.**

Pittsburgh, Penna.

### FOR SALE AT SPECIAL PRICE

100,000 ft. 2" used first quality Lap-weld pipe with recessed couplings.

#### WRITE WIRE PHONE

**INTERSTATE PIPE & SUPPLY CO.**  
Marietta, Ohio

### MINE LOCOMOTIVES

5 to 20 ton.

### MINING MACHINES

AC. & DC. Short & Arc Wall

### STRIPPING SHOVEL

### M. G. SETS & ROTARY CONVERTERS

### ROTARY DUMP

With weigh pan & Scale.

### PUMPS and FANS

### COAL CRUSHERS

Will buy, sell or exchange.

What do you need?

**THE INDUSTRIAL EQUIPMENT CORP.**

Warehouse: Carnegie, Pa.

P.O. Box 1647 Pittsburgh, Pa.

## FOR SALE

1—One NORDBERG Hoist No. 06392, 4 ft. drum, hydraulical brake direct connected 150 h.p., GE motor AC, 440 v. 3 ph. 60 cycle, speed 585, complete with panel board and ammeter.

2—Three GE 50 KVA Transformers.

3—One POMONA Vertical Pump, 75 h.p., AC, 250 v. 60 cy. 3 ph. Westinghouse motor, together with starting compensator, capacity 1000 gal. per min., 200 feet head.

4—One ALLIS CHALMERS Pump, type BS 13406, 100 h.p., motor AC, 220 v. 60 cy. 3 ph., capacity 1000 gal. per min., 250 feet head.

5—One GE MOTOFLOW model 5 KF 404 DWL Pump direct connected, 40 h.p. motor AC 440-220 v., 60 cy., 3 ph., 4" suction 2" discharge, capacity 300 gal. per min., 340 feet head.

All of the above equipment in first class operating condition

**FS-807**, Coal Age

520 No. Michigan Ave., Chicago, Ill.

# SEARCHLIGHT SECTION

## REBUILT EQUIPMENT—READY TO SHIP

### MINING MACHINES

CE-6 Sullivan 250 v. DC  
CE-7 Sullivan Shortwall 250 v. 6" bar  
1—GOODMAN DUCKBILL.

### MINE LOCOMOTIVES

6 ton Atla 220 v. 3 ph. 60 cy. 36" ga.  
10 ton Milwaukee GASOLINE  
15 ton West. 500 v. 40" ga.

### ROTARY CONVERTERS

1—500 kw. G.E. type HC-8, 600 volt, 900 rpm, complete with transformers and switchboards.  
200 kw. G.E. 275 v. DC 900 rpm, complete with transformers.  
150 kw. West. 250 v. 1200 rpm 2200/3/60.

**TRANSFORMERS**  
3—1500 kva. Pgh. 22000/6600/1/60.  
3—150 kva. Pgh. 2300/6900/1/60.  
1—150 kva. G.E. 2200/220/440/3/60.  
3—150 kva. Pgh. 6600/550/440/220/1/60.  
1—100 kva. West. 2200/220-110/1/60.  
4—50 kva. Allis Chal. 11430/6600/550/440/3/60.  
3—50 kva. G.E. 6600/575/1/60.  
1—50 kva. Burke 2200/220/3/60.  
2—50 kva. G.E. 2200/220-440/1/60.  
3—37½ kva. West. 2200/2200/1/60.  
6—25 kva. G.E. 2200/110-220/1/60.  
4—5 kva. Pgh. 6600/110/220/1/60.

### SPEED REDUCERS

Thomas, 3 HP ratio 100:1  
Cleveland 600 AT 10 HP. ratio 90:1  
Falk, 150 HP. ratio 7.31 to 1.  
Kerr, 25 HP. ratio 38000 rpm. to 720 rpm.

### 230 V. D.C. MOTORS

HP.	Make	Speed
125	G.E.	1750 rpm.
100	West.	250
85	G.E.	530
75	West.	1700 rpm.
75	West.	475
75	Reliance	1750
50	West.	975 rpm.
50	West.	1700 rpm.

### M.G. SETS—SYNCHRONOUS

500 kw. West.	600 v. DC 514 rpm. 2200/3/60.
350 kw. West.	275 v. DC 514 rpm. 2200/3/60.
200 kw. West.	600 v. DC 600 rpm. 2200/3/60.
150 kw. West.	275 v. DC 600 rpm. 2200/3/60.
125 kw. Cr. Wh.	250 v. DC 1200 rpm. 220/440/3/60 Ind.
75 kw. West.	500 v. DC 1200 rpm. 220/440/3/60/80% P.F.
30 kw. West.	50 v. 1750 rpm. dir. con. 220/440/3/60/Ind.

### SHAKER SCREEN

La Del Shaker Screen 62½" wide, 8" long.

### SLIP RING MOTORS

HP.	Make	Speed	Type
700	G.E.	393	MT-432
400	West.	1170	CW
400	West.	435	CW
300	G.E.	600	IM
280	Burke	600	EM-65
200	West.	690	CW-956A
100	West.	1750	

### A.C. GENERATOR—3 ph.

60 cy.			
319 kva G.E. 2200/440/220 v. 200 rpm.			

### A.C. MOTORS—3 ph. 60 cy.

HP.	Volts	Make	Type	Speed
150	220/440	West.	CS	1800
150	2300	West.	Syn.	900
200	2200/440/220	West.	CS	250
200	2200	G.E.	IK-15	1200
200	220/440	West.	C	720
200	220/440	West.	CS	600
225	2200	West.	CS	900
250	550/440/220	G.E.	I	600
250	220/440	West.	CS	900
250	2200	West.	CS	1200
275	2200	West.	CS	1800
300	220/440	West.	CS	1150
300	2300	West.	CS	1200
300	2200/440/220	West.	CS	450
350	220/440/220	West.	CS	450
400	2200/440/220	West.	CS	500
450	220/440/220	West.	CS	600
500	2200/440/220	West.	CS	720
600	2200/440/220	West.	CS	900

### CENTRIFUGAL PUMPS

4x3 Harris	320 rpm.
4x4 Weinman	500 gpm.
6x6 Gould	bronze, 1300 gpm.
8x8 Weinman	bronze.
5x6 Hayton	750 gpm.
6x6 Maniste	750 gpm.
6x6 American	1000 gpm., bronze.
6x6 Weinman	1000 gpm.

### ENGINE GENERATOR SETS

50 kw. 250 V. D.C. Generator direct connected to International Diesel Engine.
50 kw. 250 V. D.C. Generator direct connected to International Diesel Engine.
75 kw. G.E. 220/3/60 Bessemer GAS.
75 kva. Allis Chal. 220/3/60 dir. con. 14x14 Steam Engine.
80 kw. West. 250 V. Belted 110 Bessemer GAS.
175 kw. G.E. 220/3/60 Ridgway STEAM.
225 kw. Elec. Machy. 2300/3/60 Ideal STEAM.
1—1000 kw. G.E. 6600/3/60 150# Pres.

### TURBINE

1—Kerr Steam Turbine 450 RHP 3800 rpm., 5" intake 12" exhaust with Kerr Reduction Unit 3800 to 720 rpm., 115# pressure.
---

## DUQUESNE ELECTRIC & MFG. CO. . . . PITTSBURGH, PA.

### MINE EQUIPMENT FOR SALE

**Locomotives—Mining Machines**  
**Pumps—Motors—Transformers**  
**Steel Tipples — Rescreeners**  
**Steam Hoists—Electric Hoists**  
**Compressors — Loading Booms**  
**Engines — Generators — Scales**  
**Miscellaneous Mine Equipment**

Our own modern machine shop is available to repair and modernize your equipment.

Complete Mines dismantled and sold.

### HAIR EQUIPMENT COMPANY

Office and Warehouse  
Reed and Election Streets  
BENTON, ILLINOIS

### RAILS—CARS

All sections of rails and good serviceable second hand cars, all gauges, also spikes, bolts, frogs, switches and ties.

### M. K. FRANK

480 Lexington Ave.  
New York City  
450 Fourth Ave.  
Pittsburgh, Pa.

### RAILS and ACCESSORIES

**RELAYING RAILS**—Super-quality machine-reconditioned—not ordinary Relayers.  
**NEW RAILS**, Angle and Splice Bars, Bolts, Nuts, Spikes, Frogs, Switches, Tie Plates, and all other Track Accessories.

Phone, Write or Wire

L. B. FOSTER COMPANY, Inc.  
PITTSBURGH NEW YORK CHICAGO

### MOTOR GEN. SET

300 KW. 600 Volt, 900 rpm, Westinghouse to a 450 HP, 3 phase, 60 cycle, 80% P.F. Westinghouse Synchronous motor with A.C. & D.C. panels.

GEORGE SACHSENMAIER CO.  
Holmesburg, Philadelphia, Pa.

### MINE HOISTS

- Thomas 24" Drum, with 50 HP electrical equipment.
- Vulcan 30" Band Friction with 50 HP electrical equipment.
- Flory 48" Band Friction with 150 HP electrical equipment.
- Connellsville 54" Drum Haulage Hoist with 100 HP electrical equipment.
- Lidgerwood 54" Drum with 150 HP electrical equipment.
- Lidgerwood Haulage Hoist 60" drum 6000 ft. 1½" rope, 300 HP electrical equipment.
- Vulcan Cylinder Conical Drum Shaft Hoist, 350 ft. 1¾" rope with 400 HP motor and control.
- Nordberg Cylindro-conical Shaft 400 ft. 1½" rope with 600 HP motor and control.

And other hoists to suit all mining conditions

### Jones Mining Equipment Co.

541 Wood Street Pittsburgh, Pa.

### ROTARY CONVERTERS

500 KW WEST. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM. Pedestal type, 2380/4000 V. Transformers.
300 KW G.E. SYN. 275 V. H.C.C., 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.
300 KW G.E. SYN. 52 V. H.C.C., 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.
200 KW AL-CH SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM, Pedestal Type, 2300/4000 V. Transformers.
150 KW R.W. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM, Pedestal type, 440/2300/4000 V. Trans.

### MOTOR GENERATORS

300 KW G.E. IND., 275 V., 440 V., 3 Ph., 60 Cy., 720 RPM, Manual Switchgear.
200 KW G.E. IND., 275 V., 440 V., 3 Ph., 60 Cy., 720 RPM, Manual Switchgear.
200 KW G.E. SYN., 275 V., 2300/4000 V., 3 Ph., 60 Cy., 80% P.F., 1200 RPM, Manual Switchgear.
200 KW G.E. SYN., 275 V., 2300 V., 3 Ph., 60 Cy., 100% P.F., 720 RPM, Manual Switchgear.
100 KW WEST. SYN. 275 V., 2300 V., 3 Ph., 60 Cy., 100% P.F., 900 RPM, Manual Switchgear.

Each unit listed above is owned by us and available now for immediate purchase.

### WALLACE E. KIRK COMPANY

Incorporated  
501 Grant Building Pittsburgh, Pa.

### FOR SALE

1—200 KW Westg. Syn. Motor Generator Set 600 V. D.C., Gen., connected to 290 H.P. Synchron. motor 3/60/2200 and 900 RPM, with exciters and controls.
4—50 H.P. G.E. unused slip ring Type MTC Hoist & Crane Motors, 3/60/440 with new controls.

### IRON & STEEL PRODUCTS, INC.

13484 So. Brainard Ave., Chicago, Illinois.  
"Anything containing IRON or STEEL"

# SEARCHLIGHT SECTION

## BUY FROM A CONCERN

### LOCOMOTIVES

**Goodman:** All 250 volts.  
1—10 ton, 31-1/4-T.  
1—6 ton, 30B, 48" 1—5 ton.  
1—5 ton, W-I-2, 36".  
**Westinghouse:** All 250 volt.  
1—4 ton, 902, 48" 1—18-ton, 102, 42".  
1—9 ton, 44" 500 volt. Also 906 motors.  
1—10 ton, 915.

**G.E.:** All 250 volt, 5 ton 825, 44".  
6 ton 803, 44", as is 4 ton 1022, 44, as is  
6 ton 823, 44". 8 ton 839, motors.

AERIAL TRAMMERS \* HOISTS \* PUMPS \* MOTORS \* TRANSFORMERS \* BOND WELDERS \* RESISTANCE COMPRESSORS \* CAR RETARDERS \* DUMPS SPEED REDUCERS \* FIELD FRAMES \* ARMATURES \* GOODMAN HYDRAULIC SHOVEL \* MOTOR STARTERS AND CONTROLLERS—AC & DC \* DROP BAR SUPPORTS (Gooseneck), 29B and 29C \* MINING MACHINE TRUCKS \* SWITCHBOARDS \* CIRCUIT BREAKERS—AC & DC \* CONVEYOR HOISTS COAL CRUSHERS, double roll 12" x 16" single roll 24" x 24" and 18" x 16" \* Sullivan BIT SHARPENER \* TURBO-GENERATOR 500 K.W. 275 volt DC \* ROPE & BUTTON CONVEYOR 400' long \* LATHES, SHAPERS \* LINK BELT \* ELECTRIC SLATE DUMP \* 2 SIRENS A.C.

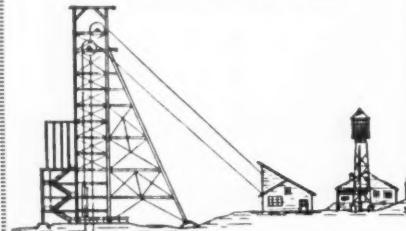
## GUYAN MACHINERY COMPANY, Logan, W. Va.

### 2 VULCAN MINE HOISTS

2 Yrs. old—9' P.D. Single Drum  
6'0" and 7'8" Face  
350 HP and 500 HP  
400 FPM and 600 FPM

### STEEL HEADFRAMES

140' high—4 Post with Back Brace  
Total weight approx. 200 Tons  
Designed for 13/4" dia. Rope,  
146 ton Breaking Strength  
5'10" x 13'6" Cage—  
5'0" x 5'0" Skip.  
Each 15 ton Capacity.  
5 Sheaves 9' P.D.  
Grooved for 13/4" dia. Cable



Pleasantville Constructors, Inc.  
Chelsea, New York

### CONVERSION EQUIPMENT, Etc.

Just overhauled (in largest shop in Cincinnati vicinity)—Ready for immediate shipment:  
1—100 KW., 250 volts DC, General Electric Synchronous Rotary Converter, Type TCC, 1200 rpm., compound wound, interpole; 3 phase, 60 cycle—AC end. Complete with Brush-raising Device; Field Break-up Switch; Speed-limit Device; Endplay Device; Field Rheostat, Etc.  
Switchboards & Transformer also in stock.

Also in Stock:  
1—200 KW. General Electric Syn. Rot. Converter, Type HCC, 1200 rpm., 600 volts DC, compound wound, interpole; 6 phase, 60 cycle—AC end.  
1—Westinghouse Motor-operated Brush Raising Mechanism.  
3—165 KVA General Electric Rot. Transformers, 6600/445 volts, 1 phase, 60 cycle, Type HJ, Form KDD, With Oil.  
30—5-ampere Type CO Westinghouse Inverse Time Overload Relays.  
1—Air Drying Oven—11'2 ft. long x 5'1/2 ft. x 5'1/2 ft., with strip-heater units, new recording thermometer and panel.

R. H. Benney Equipment Co.  
5024 Montgomery Rd., Norwood, O.

### NEED DUMP CARS?

IMMEDIATE DELIVERY  
16, 24-yd. Koppel 24, 16-yd. Western  
4, 20-yd. Koppel 16, 16-yd. Osborne & Jacobs  
3, 20-yd. Western 62, 12-yd. Western  
Illustrated specifications available  
OTHER TYPES OF CARS TOO  
Also Locomotives, Cranes, Shovels, Etc.  
**IRON & STEEL PRODUCTS, INC.**  
13484 S. Brainerd Ave. Chicago, Illinois  
"ANYTHING containing IRON or STEEL"

## BOTH FINANCIALLY AND MORALLY RESPONSIBLE

**Jeffrey:** 6 ton, and 4 ton, all gauges, 250 volt.

### MINE FANS

36"—48" and 60" with adjustable pitch blades, up to 8400 CFM Free air.

### MINING MACHINES

**Jeffrey:** 35B, 29B, and 4—28A 250 V. 2—29C with drop bar support.

**Goodman:** 12A, 12AB, 12AA, 12G3A, 124EJ.  
1—12G3 250 volt and 2—112 DA, 500 volt.

2—Permissible Type 12CA.

**Sullivan:** CE7, CE9, CE10, CR10 Low Vein  
1 Class 5 Buddy and Shearing Machine.  
AC and DC.

### SUBSTATIONS—275 volts, D.C.

2—200 KW. West. Converters.

2—200 KW. Ridgeway Converters.

1—150 KW. G.E. Rotary.

1—150 KW. West. Rotary.

2—150 KW. 2—100 K. Ridgeway M-G Sets.

1—150 KW. West. M-G Sets.

1—200 KW. G.E. Rotary Converter.

Available for Immediate Delivery

## USED COPPER WIRE

65 tons—3/0 BARE TROLLEY, Grooved

25 tons—4/0 BARE TROLLEY, Fig. 8

35 tons—4/0 BARE SOLID ROUND

40 tons—4/0 INSULATED SOLID ROUND

LONG LENGTHS—COILED and REELED

## DULIEN STEEL PRODUCTS, INC.

OF WASHINGTON 414 FIRST AVENUE SOUTH SEATTLE, WASHINGTON

## BATTERY LOCOMOTIVES

4 Ton Type D Ironton 36" Ga. with 36 cells, 19 Plate Exide Battery.  
5 1/2 Ton Type D Ironton 36" Ga. with 48 cells, 21 Plate Exide Battery.  
Charging M. G. Sets & Panel for each loco.  
5 Ton Jeffrey 42" Ga. 2 motor.

MOORHEAD-REITMEYER CO. INC.

Pittsburgh, Penna.

Stripping Contractors Attention.  
WIRE CENTER CABLE FOR SALE  
AT A GREAT SAVING

1—1 1/2" dia. 6119, IMPROVED PLOW STEEL, IN-  
DEPENDENT WIRE ROPE CENTER, Lengths  
run from 1500 feet to 2000 feet each reel.

Immediate shipment.

TERRENCE P. WYNN

55 West 42nd Street NEW YORK CITY, N. Y.

Immediate Shipment  
Carload New Mine Car Wheels  
Also Small Tonnage Light  
Section Rail

FS-632, Coal Age

330 W. 42nd St., New York City

## RELAY RAILS... Shipments from Stock

45 lb.—50 lb.—56 lb.—60 lb.—70 lb.

Spica Bars  
Track Bolts

Lock Washers  
Track Spikes

Tie Plates  
Cross Ties  
Bumping Posts  
Frogs and Switches

E. C. SHERWOOD, 46 Church St., New York Tel. CO 7-3322

## BULLDOZER TRACTORS

Cletracs, model 555, with Wood Isaeson hydraulic angle or bulldozers. Complete with oil pan and radiator guards. Fully electrically equipped. Thoroughly overhauled, ready for work. Price \$1500 each. Also other tractors at low prices.

O. C. EVANS  
Mt. Sterling, Ky.

## FOR SALE

Coal Screening System, including  
Crusher, for Screening various  
sizes of coal.

HAWS REFRactories COMPANY  
P.O. Box 350 Johnstown, Penna.

FOR SALE  
4—6 Ton G.E. GATHERING LOCOMOTIVES  
42" Gauge, 250 Volt.

1—8 Ton G.E. 42" Gauge.

MINING MACHINERY SALES CORP.  
1214 Fisher Bldg. Chicago, Illinois

## New

### "SEARCHLIGHT" Advertisements

received by July 27th will appear  
in August issue, subject to space  
limitations.

## FOR SALE STEEL TIPPLE

Three track Roberts and Schaffer steel  
tipple with Marcus shaker screen and  
loading boom, 150 to 200 ton capacity.

Write FS-624, Coal Age  
330 W. 42nd Street, New York, N. Y.

Departmental Staff

### COAL AGE

330 West 42nd St., New York City

COAL AGE—Vol. 47, No. 7

## SEARCHLIGHT SECTION

### Desirable Electric Equipment—Prompt Shipment From Our Warehouse

#### 750 KW TURBINE

Westinghouse Mixed Pressure 110# H.P.  
2 to 4# I.P. 3600 RPM with gear box to 900  
RPM, with accessories.

(Formerly con. to 750 KW 250 v. 900 RPM Gen.)

#### SYN. MOTORS 3 ph. 60 cy.

HP	Make	V.	Speed
350	Al. Ch.	2200	600
225	Ideal	440	900
2—75	Westgh.	2200	900
75	Westgh.	220	1800

#### M-G SETS 3 ph. 60 cy. (Syn.)

150 KW West.	550 v. DC 2200 v. AC—1200 RPM
150 KW Ridgway	250 V.—2300 V. AC 900 RPM
100 KW Cr. Wh.	2502 DC—440/3/60 1200 RPM.
100 KW Westgh.	250 v.—DC 2200 v. AC 1200 RPM.
75 KW West.	250 v.—2300/3/60 900 RPM
90 KW Al. Ch.	250 v. 2200 v. AC 900 RPM

#### LOCOMOTIVES

4 Ton Ironton 36" Ga. Type D with 36 cells 19 plate Exide Battery.
5½ Ton Type D Ironton 36" Ga. with 48 cell 21 plate Exide Battery.
Charging M.G. Set & Panel for each loco.
5 Ton Jeffrey Storage Battery 42 to 44" Ga. 2' BB motors. Battery box on top.
6 Ton Whitcomb 250 v. 40" Ga.
10 Ton West. 250 v. 42" Ga.

#### AIR COMPRESSORS

550 cu. ft. 100# Bury 2 stage

160 cu. ft. Chic. Pneu. 100#

#### MINING MACHINES

35 B Jeffery 250 v. 36" Ga. truck 6' bar #11,416.

2—CE 7 Sullivan DC standard 30 HP

1—12 G3 Goodman Std. Truck 220/3/60 6' bar.

#### SLIP RING & SQ. CG. MOTORS

(3 ph. 60 cy.)

HP	Make	Speed	Wdgt.	Type
700	G.E.	393	S.R.	MT 432
450	G.E.	257	S.R.	MT
400	West.	500	S.C.	CS
300	G.E.	600	S.R.	IM
200	Cr. Wh.	440	S.R.	28
200	Al. Ch.	600	S.C.	
125	Al. Ch.	435	S.R.	
125	Burke	1200	S.C.	
100	F.M.	600	S.C.	BB
100	Burke	900	S.C.	
100	GE	500	S.R.	MI-25 cy.
75	West.	870	S.R.	CW752C
75	West.	575	S.R.	CW868A
75	G.E.	865	S.C.	KT

#### HOISTS

75 HP Ottumwas sgl. fr. drum 36" Dia. 30" wide 8" flanges geared 75 HP CI Westgh. slip ring motor with rev. drum control

#### 75 HP Lidgerwood sgl. fr. drum

50 HP Diamond 2 drums same shaft

30 HP Clyde sgl. drum AC Motor

25 HP Thomas sgl. drum AC Motor

15 HP Lidgerwood sgl. dr. AC Motor

#### 400 TRANSFORMERS

(Westgh. & GE 1 ph.)

Eu.	KVA	Pri. V.	Sec. V.
3	1	2080/2200	115/230
5	2		
100	5		
137	7		
71	10		
10	15		
25	25		
1	30		
37	Rotary	4400/185	
6	50	2080/2200	
2	10Q		

#### 3 Phase

230/460

#### ENGINE GENERATOR SETS

100 KW 250 v. DC Westgh.—Skinner Engine

#### DC MOTORS (230 Volts)

HP	Make	Speed	Type
30	West.	600	S-9
20	West.	900	SK-100L
20	West.	750	SK-110L

**MOORHEAD-REITMEYER CO., INC.**  
PITTSBURGH, PENNSYLVANIA

Immediate Shipment  
Low Prices

## NEW RUBBER

Guaranteed  
High Grade

### CONVEYOR and TRANSMISSION BELTING

#### CONVEYOR BELTING ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"
42"	5	1/8"	1/16"
36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
30"	4	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
12"	4	1/16"	1/32"

#### TRANSMISSION BELTING HEAVY-DUTY FRICTION SURFACE

Width Ply Width Ply Width Ply

ENDLESS "V" BELTS			
"A" — WIDTH — All Sizes			
"B" — WIDTH — All Sizes			
"C" — WIDTH — All Sizes			
"D" — WIDTH — All Sizes			
"E" — WIDTH — All Sizes			

ELEVATOR BELTING			
HEAVY DUTY RUBBER COVERED			
Width Ply Top-Bottom Covers			
12"			
14"			
16"			
18"			

RUBBER HOSE			
ALL SIZES FOR			
AIR — WATER —			
STEAM — SUCTION —			
FIRE — WELDING —			
ETC.			

Inquire For Prices :— Mention Size and Lengths

**CARLYLE RUBBER CO., Inc.**  
66 PARK PLACE New York, N. Y.

## LINK-BELT UNLOADING TOWER

### SUITABLE FOR COAL OR ORE

#### GANTRY TYPE • CAPACITY 750 T.P.H.

RAIL SPAN 44' • OVERALL HEIGHT 114' WIDTH 166'

COMPLETE WITH WIRING AND 8 SELF-CONTAINED

3 PHASE MOTORS AND BUCKET

**ERMAN-HOWELL & CO., INC.**  
332 S. MICHIGAN AVE. CHICAGO, ILL.

## IMMEDIATE SHIPMENT

#### CUTTING MACHINES

250 Volt
1—224-AA Goodman low vein slabber 30" high
1—124-EJ Goodman Slabber
1—12-A Goodman shortwall
1—CE-7 Sullivan shortwall
1—CE-10 Sullivan shortwall
1—CR-2 Sullivan low vein
2—CE-7 Sullivan 220 volt AC
1—CE-B Jeffrey with low vein truck

#### LOADING MACHINES

1—8-BU Joy practically new 250 volt
1—8-BU Joy 550 volt
1—44-DD Jeffrey 250 volt

#### LOCOMOTIVES

1—10-ton Westinghouse 500 volt
1—6-ton Ironton with G.E. Reel 26" high over all

#### MISCELLANEOUS

1—50-HP. Diamond incline hoist complete
1—150-KW M-G set 500 volt
1—15-ton bridge crane, 50' span
Spare armatures for locomotives and machines
AC and DC stationary motors

LET US KNOW YOUR NEEDS—WE BUY, SELL, AND TRADE

**ALL-STATE EQUIPMENT CO., Inc.**  
LOGAN, WEST VIRGINIA

#### IMMEDIATE DELIVERY

10—JOY 5 BU LOADING MACHINES, 250 volt, 42" gauge 52" height, 35 H.P. motors; all in first class operating condition, can be seen in operation in Central Illinois, loading large tonnage. IMMEDIATE DELIVERY.

**MINING MACHINERY SALES CORP.**

1214 Fisher Building CHICAGO

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## WOOD PIPE for Mine Drainage

Wyckoff Wood Pipe has an 87 year record of perfect resistance to the corrosive action of sulphurous mine water. It is an ideal, long-time investment—light, easy to lay, and relatively low in first cost.

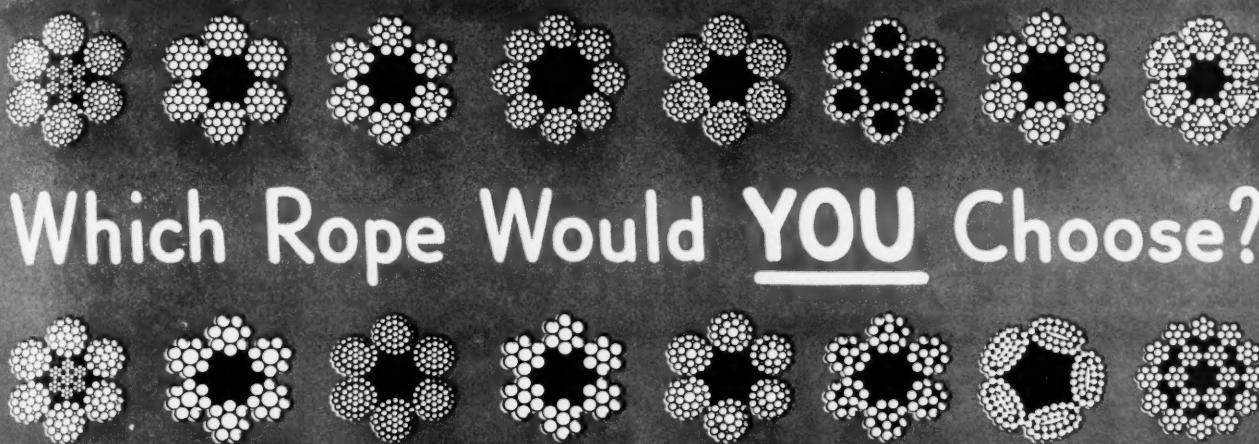
We also manufacture a special Hard Maple Pipe for flushing culm in the Anthracite Region and wood covering for underground steam lines.

Established  
1855



A. WYCKOFF & SON CO.

Office and Factory  
No. 35 Home Street, Elmira, N. Y.  
The Originators of Machine Made Wood Pipe



## Which Rope Would YOU Choose?

*Economy* **DEPENDS ON THE RIGHT CHOICE**

(Reading Time: 30 seconds)

There is a wire rope for every application. Make sure you are using the proper rope on each installation. The wrong rope can be extremely wasteful of time, money and steel.

Some machines have sheaves which impose severe bending strains on the rope. On some machines the cable drags through abrasive stone, gravel or rock. Some ropes must endure the heat of handling ladles of molten metal, while others must run at excessively high speeds. For each job there is a one best rope, not only in construction but grade. Consult an American Cable engineer.

Ask him also about American Cable **TRU-LAY PREFORMED** wire rope.

**TRU-LAY** has set new and higher standards for wire rope service.

Conserve steel, time and money by using the proper construction and grade of **American Cable TRU-LAY Preformed**.

### AMERICAN CABLE DIVISION

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Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco

**AMERICAN CHAIN & CABLE COMPANY, Inc.**  
BRIDGEPORT • CONNECTICUT



ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain,  
WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope,  
Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire,  
READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*



# GETTING "SOFT" ...EH?

**B**EWARE of an America aroused!"

Sure we've been rolling on rubber—eating our sirloin steaks—lolling in the luxuries which only free Americans have the God-given genius to create, and the capacity to enjoy. But we can still take it, and we can still dish it out.

The world knows now that this "love of luxury" is just a thin outer garment, easily whipped off in an emergency—and that, underneath it, there are muscles of steel.

Sacrifice? We will sacrifice anything but our Liberty! Suffering? We still remember about Valley Forge, and the blood of our fathers on the snow!

Death? Better death, any day, than life without freedom!

So they said we'd rather lose a war than lose an election? And those cracks, dividing us, were deep craters—not just surface scratches? Management wouldn't work with men, and men wouldn't work with management? And we couldn't get going *fast enough* to become a real factor in this war?

What a jolt the Axis is in for! You might just as well try to sweep the tide back with a broom as try to buck American machines, driven by free, skilled American workers.

♦ ♦ ♦

Inspired by the job our own workers are doing, we view this crisis, not with alarm—but with confidence. Every lathe, every drill, every tool in our plants has been turned into a weapon of war—every worker, man or woman, into a PRODUCTIONER—a soldier in overalls. Such spirit, such skill, such strength cannot lose—for these men and women are fighting *with their hearts*, as well as with their heads and their hands—fighting, along with the millions of other patriotic workers throughout all America—to STAY FREE!

LINK-BELT COMPANY—INDIANAPOLIS—PHILADELPHIA—CHICAGO—ATLANTA—DALLAS—SAN FRANCISCO—CEDAR RAPIDS  
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